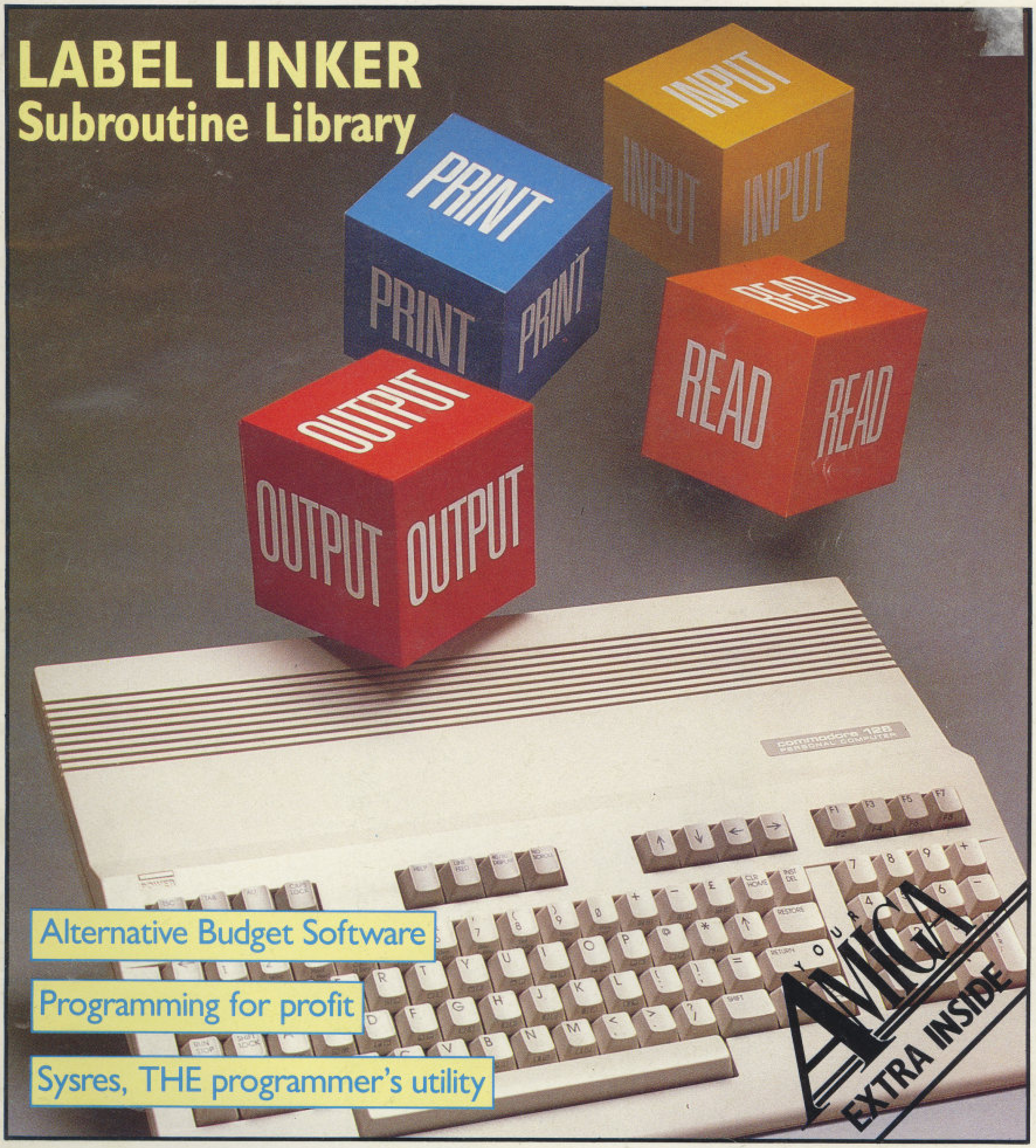
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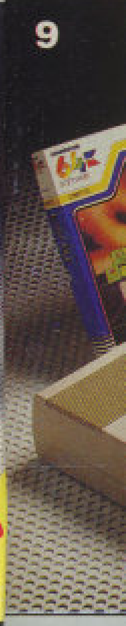
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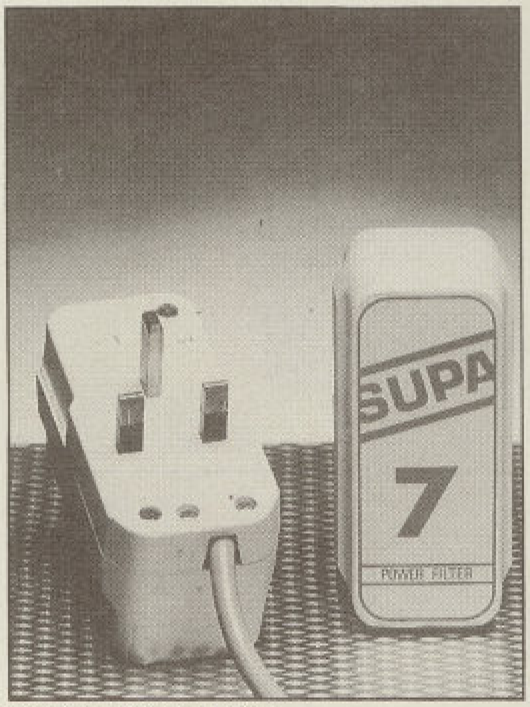
Smooth Operator

If you've ever experienced a computer reset caused by a surge in the mains supply then an investment in a power filter such as Warwick Products' Supa 7 could prove worthwhile.

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Excluding VAT, the price is £14.95 plus 50p postage and packing.

Touchline:
Warwick Products: *50 Marsh Wall, West India Dock, London E14 9XJ.* ***Tel:*** *01-538 2535.*



The Supa 7 Power Filter

Re-Inkarnation

Tired, old printer ribbons can be given a new lease of life with MGA Microsystems' MacInker unit.

Whether the ribbon is made of felt, silk, cotton or nylon, the MacInker unit will evenly re-ink it via a unique capillary mesh. The manufacturer claims that the use of this unit can extend the life of a ribbon by as much as 40 times for only a few pence each time it is recharged.

Actual prices for any cartridge or reel system can be supplied on application to MGA but typical costs range from £60 to £80 inclusive of VAT and postage.

MGA also market Supra Corporation's 64K buffer for Centronics printers. Known as the Microstuffer, this unit has the added benefit of being able to reprint the buffer contents at the touch of a button.

The MicroStuffer comes complete with a Centronics input socket and output lead for £59.09 plus VAT.

Touchline:
MGA MicroSystems: *Pear Tree, Appledore, Kent TN26 2AR.* ***Tel:*** *0233 83571.*

Star Turn

The NL-10 is dead, long live the LC-10! At the recent Which Computer? Show, Star Micronics announced the launch of a new low-cost printer with a higher specification but at a lower cost than the NL-10 that it replaces.

The new multifont LC-10 offers printing speeds of 120 characters per second in draft mode and an NLQ speed of 30 cps, six resident fonts and seven print pitches selectable from a comprehensive front panel.

Another desirable feature which has been included on the new machine is a push feed tractor mechanism which means that paper wastage is kept to a minimum especially when using short form, tear off sheets such as address labels.

An automatic paper parking capability removes the need to remove and relace tractor fed paper before and after feeding in single sheets for those important one-off missives.

The retail price of the LC-10 is £229 excluding VAT.

Touchlines:
Star Micronics UK: *Craven House, 40 Uxbridge Road, Ealing, London W5 2BS.* ***Tel:*** *01-840 1800.*

Little Brother

A new low-cost printer launched by Brother recently promises a print speed of 168 cps. The compact Brother 1209 has a dual interface and three resident fonts: Prestige, Gothic and Quadro.

Priced at £265, the 1209 has Epson and IBM compatibility for both sheet and tractor feed paper.

Touchline:
Brother Computer Peripherals Division, Jones+Brother: *Shepley Street, Guide Bridge, Audenshaw, Manchester M34 5JD.* ***Tel:*** *061-330 6531.*

N-n-n-n-Cascade

Billed as the 'ultimate simulation of true warfare', Cascade have released the first part of the 19 wargame duet based on the music by Paul Hardcastle.

19 part 1 – Boot Camp is the training ground for the raw 19 year old recruit stars in the game. Boot Camp contains detailed graphic images and arcade action as the recruit progresses through basic training on a playing area (war zone) which is included in the package as a full-colour map.

On completion of basic training you'll have to wait until the second part, 10 part 2 – Vietnam, is released later this year.

Boot Camp is available on C64 cassette for £9.95 or £14.95 on disk.

Touchlines:
Cascade Games: *1-3 Haywra Crescent, Harrogate, North Yorkshire HG1 5BG.* ***Tel:*** *0423 525325.* ***Ansaphone:*** *0423 504663.*


John Lewis and Nigel Stephens make n-n-n-notes about basic training on the Yorkshire Moors

DATA STATEMENTS

Budget Booster

Following the recent tie up between Mastertronic and Activision, the limited deal for Activision's back catalogue has been increased to include all the present and future products on the Activision label. The first batch, released in January included Eidolon, Ball Blazer and the smash hit of several years ago, Ghostbusters.

Rod Coussens of Activision commented, "In a business where shelf life may be short lived, the ability to recycle through budget labels is beneficial to all concerned. We are pleased to forge this association with Mastertronic and look forward to an on-going, successful relationship."

In a reciprocal bout of mutual back slapping, a spokesperson at Mastertronic responded, "We are delighted with this deal with Rod, the Activision range reinforces our policy of only releasing the very best quality products on the Ricochet label."

The Activision/Ricochet titles will be released at £1.99 and £2.99 for all 8-bit machines and £9.99 for 16-bit versions. The deal is important for the image of Mastertronic which is suffering a little under the new Gallup poll sampling system. Despite extremely powerful shouts of "humbug" from Mastertronic, Code Masters are still claiming to have ousted them from the top slot in budget software sales.

Touchline:

***Mastertronic:** 8-10 Paul Street, London EC2. **Tel:** 01-377 6880.*

***Activision:** 23 Pond Street, Hampstead, London NW3 2PN. **Tel:** 01-431 1101.*

A Change of Place

September sees a change of venue for the PCW Show from Olympia to the larger main hall of Earl's Court.

"The Show has outgrown Olympia both in terms of floor space and the increased number of visitors that it now attracts," and PCW Show manager Mike Blackman. He then explained, "It is a move that we have wanted to make for some time and the increased demand for space in 1988 means that the move has to be made now."

The move enables Montbuild, the Show's organisers, to divide the exhibition into three sections instead of the usual two. The Business and Leisure areas will still continue but the third area can now be developed to appeal to serious home computer and small business users.

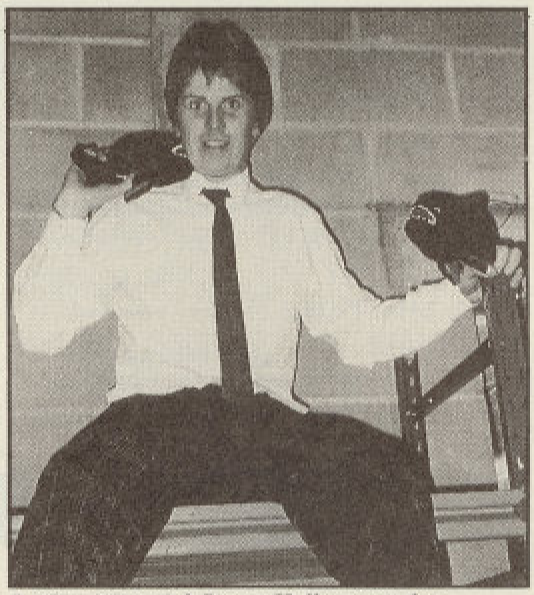
Each section will have its own separate entrance which should relieve the businessmen who had to queue for extended periods during last year's Show. The extra space inside each hall will also allow the companies to indulge in more ambitious displays than previously permitted at Olympia.

This year's Show is scheduled for 14-18 September and the new venue is also more easily accessible to what promises to be yet another record-breaking crowd of computer users.

Touchline:

***MPA Ltd:** 8-10 Hallam Street, London W1N 5LF. **Tel:** 01-636 3205.*

Alternative Entertainment



In the right vein? Roger Hulley grapples

Alternative, reputedly the fastest growing software house, has cast a wider net to trawl in the rights to products from Piranha, Audiogenic, Incentive and Bubble Bus.

In less than a year Alternative has charted 30 times and,for one heady period during the last PCW Show, it held the top slot in the C16, Amstrad, Spectrum and consequently, the overall charts.

Roger Hulley, Alternative's Managing Director, boasts, "I don't think the public could ask for better value. I can see no reason why products such as Trap Door or Popeye at £1.99 should not dominate the charts for months to come."

Also on the Alternative menu are Moon Cresta from Incentive and Audiogenic's Psycastria.

Touchline:

***Alternative Software:** Units 3-6 Baileygate Estate, Pontefract, West Yorkshire WF8 2LN. **Tel:** 0977 797777.*

Hewson v Telecomsoft

Following an injunction and subsequent court case in which Telecomsoft and Hewson contested publishing rights for Morpheus and Magnetron, it was decided for the moment that Telecomsoft could go ahead and release the titles on their Firebird label.

For those who may not have heard the story, the two games, programmed by Graftgold, were originally planned for release by Hewson and the machinery was already in motion for the promotion of the programs at last September's PCW Show. On the eve of the show, Andrew Hewson was horrified to learn that Steve Turner, Graftgold's boss and author of Magnetron, had signed a programming contract with Telecomsoft for all future Graftgold products and separate contracts for Magnetron and Andrew Braybrook's Morpheus.

In a single blow Hewson was not only severed from what he imagined would be his two Christmas hits but also from his greatest asset, Andrew Braybrook – author of Paradroid and Uridium.

Prior to the announcement, it was whispered that Turner and Braybrook were searching for a new publisher and it was also rumoured that they had already been flirting with Electronic Arts.

Although Telecomsoft have been given the go ahead to publish, the Hewson versus Telecomsoft dispute will not reach a conclusion for several months and Andrew Hewson will not cease the fight until the bitter end.

DATA STATEMENTS

Mini Office Moneyspinner

It's not often that a software package gets a heavy plug on television, the last software package that received heavy promotion on the haunted goldfish bowl was Rainbird's Starglider on Get Fresh. For a business package to receive a mention is an even rarer occurence but this is the accolade which Mini Office II has received.

Channel 4's consumer finance show, Moneyspinner, selected the Mini Office II suite of programs as the best of four home computer finance packages.

The challenge came from Supercalc 3, Money Manager and PlanIt – a second product from Database, the manufacturers of Mini Office II. Each program was judged on three main criteria: value for money, ease of use and ability to tackle the job in hand successfully. On all counts Mini Office II scored maximum points and, according to Moneyspinner's producer, Belinda Giles, 'would be most suitable for our viewers attempting to produce accounts on their home computer.' Mini Office II is available for the C64 and in an expanded form for the C128 for £14.95.

Touchline:

Database Software: *Europa House, Adlington Park, Adlington, Macclesfield SK10 5NP.* ***Tel:*** *0625 878888.*

Straw Poll

If anyone can find a Commodore 64 program disk that can't be loaded from the latest version of the Excellerator Plus disk drive, Evesham Micros' managing director, Richard Austin, will supply a free Amiga 500. In his own words he expresses his confidence in the Excellerator's compatibility by saying, "If we have to give away more than two I will eat my hat".

The competition has been arranged through Evesham's PR representatives, Solution Public Relations, because Evesham Micros is keen to ensure that the Excellerator is compatible with all Commodore 64 software designed to load from the 1541C disk drive. This would further enhance the growing reputation of the streamlined Excellerator which retails at £159.95, that's £40 cheaper than the Commodore drive.

Relating to the competition, Richard Austin commented, "We have tried to make the Excellerator as efficient as possible but we cannot test every computer game because there are too many of them. Who better than the public to attempt this task for us?

"Despite the scale of this competition, I doubt whether we'll have to give away many Amigas."

All entrants have to do is to get a postcard and write down the name of any Commodore 64 game (obtained from a computer shop) which is compatible with the 1541C but not with the latest Excellerator Plus. The first entry received for each different program will win an Amiga. Postcards should be sent to Evesham Micros, c/o Solution Public Relations, Carlton House, 11-12 Marlborough Place, Brighton BN1 1UB. The closing date is 1st March, 1988.



Evesham Micros' Richard Austin prepares to enjoy a meagre diet

Touchline:
For the competition
Solution PR: *Carlton House, 11-12 Marlborough Place, Brighton BN1 1UB.*

Product enquiries:
Evesham Micros: *63 Bridge Street, Evesham, Worcestershire WR11 4SF.* ***Tel:*** *0386 765500.*

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- **PICTURE SAVE.** Save any Hires multicolour screen to disk at the push of a button. Compatible with Blazing Paddles, Koala, Artist 64, Image System etc.
- **SPRITE MONITOR.** Unique Sprite monitors allows you to freeze the action and view all the sprites, watch the sprite animation, save or delete any sprite. Load sprites from one game into another to make customised programs.
- **POKES/CHEAT MODE.** Press the button and enter those pokes for extra lives etc., then restart the program or make a backup. Ideal for custom games.
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Contains routines for transferring many of the non-standard multi-load games from tape to disk. Over 40 titles. Latest additions are **LAST NINJA, ROAD RUNNER** (infinitive lives option), **BLOOD 'N' GUTS** (play any event), **DECEPTOR, LEADERBOARD EXEC** and **WORLD CLASS, KILLED UNTIL DEAD, MASK, INDIANA JONES, IMPLOSION, TAIPAN,** plus all the classics including **SUMMER GAMES, WORLD GAMES, DRAGONS LAIR** 1 and 2, **GAUNTLET, SUPERCYCLE** etc. Works in conjunction with **ACTION REPLAY.**

Disk includes **GRAPHIC SLIDESHOW** for displaying pictures saved with **ACTION REPLAY.** Plus Warp 25, Superboot – non Action Replay owners can speed up their 'expert' or 'freeze machine' programs to see what they have been missing.

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Programming

If you've got a brill idea for a game, but you're not too sure how to go about it, this article will provide the tips and advice that will put you on the right road

By Tony Hetherington

Have you ever looked at a game or read a review and thought that you could write a chart topping game? If so, then why not give it a go. The worst thing that could happen is that you're left with a game that's simply enjoyed by your friends or you could become the first software millionaire!

Before we start it is important to remember that not everyone has your outlook on games and the market, so if you hit a brick wall, back off and try elsewhere. This can be a frustrating business but don't add to your problems by engaging in arguments fueled by dented egos.

So you want to write a game? The first thing you have to do is find answers to the following important questions.

- *What type of game is it going to be?*

Is it going to be an adventure, an arcade game, a sports simulation or a war or strategy game? It is an important choice since arcade games sell considerably more than others.

- *Is it original?*

If it isn't then forget it, as no one is going to consider the 81st version of Gauntlet, Space Invaders or Marble Madness. You can only con some of the people some of the time and your're unlikely to get away with a ripped-off game. After all how would you feel if someone stole your ideas?

- *Which computer will it run on?*

The C64 still has the biggest market and so a game for this machine should sell well. However, you should also think whether the game can be converted to other home micros; does it need the extra capacity offered by disk or can it be updated to become one of the growing band of Amiga games. Whatever machine you choose you should try and push it to its limits.

- *Is this game your best idea?*

It's surprising how often a programmer gets stuck in a project and shelves other ideas until they've finished what they're working on. Sometimes the best idea never sees the light of day.

- *Is the computer necessary?*

An odd question but an important one when you consider the number of games of the book, film and board game that are appearing on the shelves. If the computer version is actually harder to play then it's unlikely to be accepted.

- *Will the game have lasting appeal?*

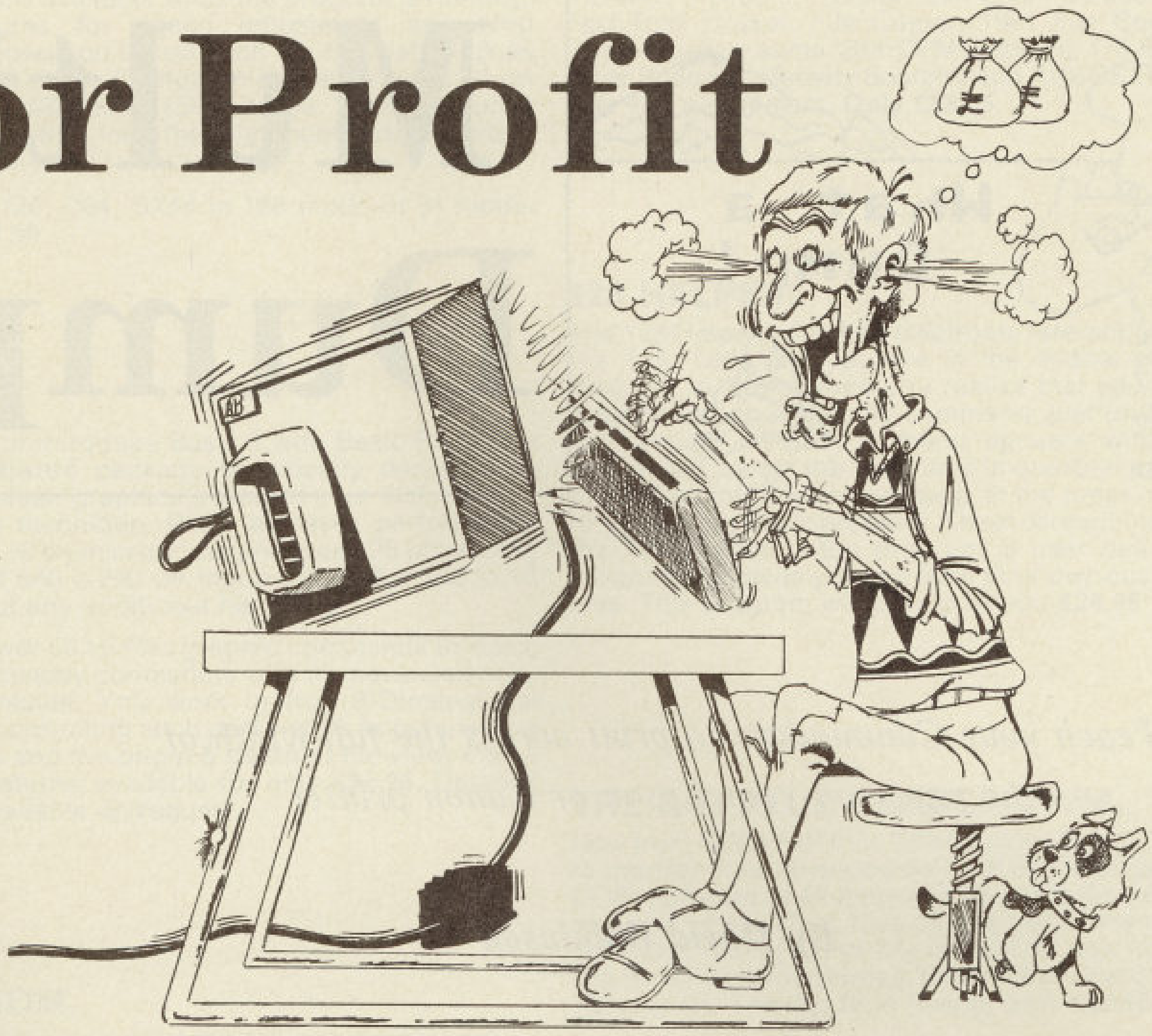
It takes almost six months for a game to reach the shops so don't make it too topical as it will be out of date by the time it's released. For example, at the time of writing this the news is full of storms, floods and stock market crashes but by the time you read this ...

Once you've pondered these pertinent points you should have a working idea. If you haven't, then don't despair as software houses are always on the look out for programmers for conversion work or to team up with a games designer who can't program. The best way to approach them is to show them what you can do either through demo programs or your version of a coin-op game.

Writing the Game

When you write the game use a well-known development toolkit or

for Profit



assembler as well as commercial sprite editors and graphic packages as this will make life easier.

Include as much animation and graphic detail in your game as you can possibly cram in as this will not only grab the eye of the software manager but also the buyers and reviewers. For example, the most memorable part of Odin's Heartland is the way the skeletons crumble when they're shot.

Leave room for a sound track or sound effect if you can't do them yourself, but ensure they can be turned off as many players have their games going late into the night.

Include features such as high score tables, load and save game options and joystick and user definable keyboard options to make your game as playable as possible. If you've got room, include a demo routine or short on-screen instructions so players can load and go.

Write your program using clear structured routines and keep them well documented. It may sound like hard work but it will actually make things a lot easier particularly when your debugging or make changes. Software houses nearly always want changes.

When you've finished coding, test and debug it and ensure that you actually like playing it. If you don't then nobody else will. When you think you have the best version save it several times, try it on your friends and then submit it to a software house.

Submitting Games

It is important to ensure that you include all the relevant information including details of the machine requirements, a short description of the game describing why it's different and hints or saved game positions so that the software evaluator can see as much as possible, as quickly as possible.

This is all part of making it easy for the software house to say, yes!

If you haven't finished the game then send at least a demo routine or some sample graphics as it's very difficult to get an idea across to a busy man only on paper.

Send the game to the software house that's right for your type of game. For example you'll probably be wasting your time sending an adventure to Elite or a shoot-em-up to Level 9.

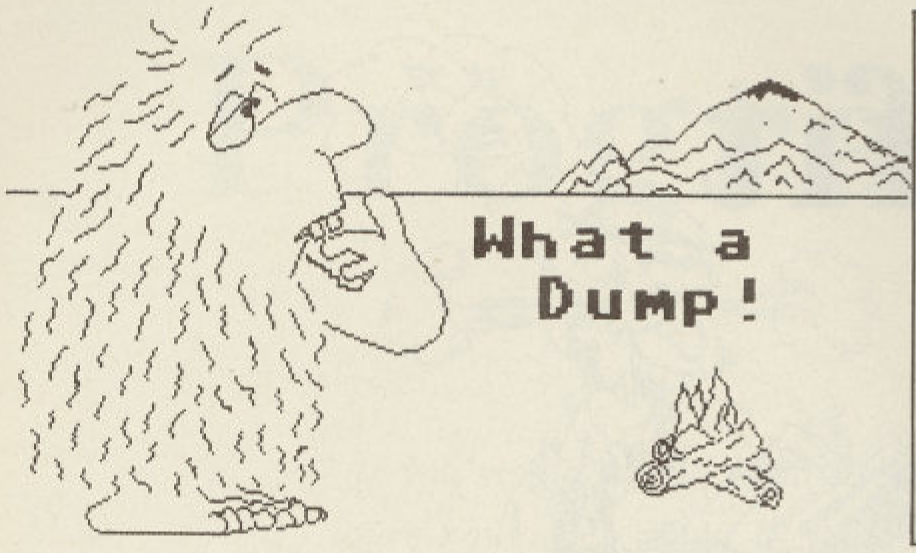
Finally, don't give up. It is unlikely that your first effort will be accepted on the first attempt so take constructive criticism and learn from your mistakes.

How much can you earn?

The papers were once full of the thousands that young programmers were making and I'm afraid these accounts are largely exaggerated. However, if a game is accepted and sells well on more than one formit it could bring in a tidy sum. Therefore you should be careful about what deal you accept. Some software houses offer a fixed sum while others have a royalty payment paid for each game sold. You're probably better off with a royalty deal since it also shows confidence in your own game. Either way ask for an advance and a contract and check the small print.

There is no real need to involve lawyers and secrecy clauses to protect your work since I find that sending a copy of the program to yourself by recorded delivery is proof enough.

If you think this is all too much then why not start the ball rolling and send off a program to *Your Commodore*. If it's accepted you'll receive a cheque for your program and you'll be well on your way to programming for profit!



Multi Dump

Teach your Commodore to print across the full width of the paper on your Epson or Canon printer

By David Wilkinson

With this handy utility, high resolution and character screens can be dumped at full or half paper width by simply pressing a function key. A user friendly BASIC program is provided to simplify the setting up of the machine language program. Screen location addresses can be given in decimal or hex and you can also dump screens which use special character sets. Any printer which uses the Epson set of control codes can be used when connected to the user port on the C64.

The Epson FX80, the Epson LX80, the Canon PW-1080A or the Kaga Taxan printers will all work correctly with Multi Dump. You will need a cable with a plug for the C64 user port on one end and a Centronics printer plug on the other end. These can be bought made up for about £15, or you can make up your own as described in the October 1987 issue of *Your Commodore*.

Typing in Multi Dump

The machine code program which does the work is given in program 1 as a self-checking BASIC program. Type this in and save it before you run it. Once you have it safe, type RUN. The chances are that you will have made a typing error, and if so the program will tell you which line the error is on. Correct the error and RUN it again. When there are no more errors you should save the program again.

You can now test Multi Dump by typing SYS52662 and then pressing function key f5. Provided your printer is switched on and connected correctly you should get a half page width dump of your screen on the printer. If you have additional blank lines on your printout don't worry, this can be corrected by using program 2, which is the BASIC set-up program for Multi Dump.

Using the Set-Up Program

Press RUN/RESTORE to switch off Multi Dump and type NEW (I hope you remembered to save your corrected program!). Now type in program 2 and save it. Notice the gaps in the line numbers, these gaps are for lines which will be added later. A dump of the first page of the set-up program is shown in figure 1. As you can see, the set-up program asks questions which must be answered with Y for yes, or N for no. Answering Y for each question will restore the default values to the Multi Dump machine code. If you answer N to any of the first three questions, you will then be asked for the location addresses of the screen or character set you want to use.

These can be given as decimal values, or, if preceded by the dollar sign, as hexadecimal values, e.g. the program will accept either 57344 or $E000 as equally correct forms at input.

You can decide where on the page you want to position the small screen dump. Typing in zero puts the picture on the left half of the page, while 40 puts the picture on the right half.

If your printout has narrow black bands across the page, answer N to the narrow line feed question. This will increase the line feed from 23/216 inches to 24/216 inches and should correct the problem. If your printout has white bands between each printed

Continued on page 16

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The 128 Helper is the first electronic reference manual for the 128. Let's say you are in the middle of writing a program in Basic when you realize that you need more information on a specific command, just touch the help key, almost instantly a menu appears with all Basic commands, select the command in question and a screen of detailed information appears, at the press of a key you return to your Basic program. The most exciting feature of the 128 Helper is the program is user definable. The program will guide you to create your own custom screen files. This program will only cost you **£24.95**

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line, this is because the printer is set to produce an automatic line feed for each carriage return. To eliminate this, answer N to the line feed question.

The machine code for Multi Dump is tucked away at the top of the spare memory block – from 52646 ($CDA6) to 53247 ($CFFF). This means that it can stay there without interference from BASIC programs and is safe even from many machine language programs which are stored at 49152 ($C000).

Once you have installed Multi Dump, you can load your own BASIC or Machine language program, use it to draw a picture, or create a screen from CBM characters and then press the appropriate function key to get a hard copy. (This will work only if your program does not overwrite Multi Dump, or change the interrupt vector.)

Save the modified set-up program under a new name and then load and run program 1. The machine code for this program is now in memory and can be saved by typing in the following commands directly:

```
POKE43,166:POKE44,205
POKE45,0:POKE46,208
then for tape users:
SAVE "MULTIDUMP/C"
or for disk users:
SAVE "MULTIDUMP/C",8
```

Your machine code program will then be saved from memory. This procedure alters the memory pointers and to restore them to the usual values you must switch the computer off and then on again. For tape users it is important that the machine code program is stored immediately following the modified set-up program.

Printing your Character Screen

Press key f5 or f7 and Multi Dump will give you an exact copy of your screen as you see it. This means that you can use all the graphic characters, or the lower case character set and they will all be faithfully reproduced. The default character screen is the normal text screen which starts at 1024 ($0400) but the BASIC set-up program allows you to change this to any memory block you want. If you wish, you can also use Multi Dump with special character sets.

Printing your High Resolution Screen

Pressing key f1 or f3 will result in the high-res screen being dumped to the printer. The high-res screen is stored at a different memory location to the normal text screen. Multi Dump uses as a default the memory block at 8192 ($2000) which is used by many drawing programs.

However, the BASIC set-up program allows you to alter this to any block you wish. The drawing shown in figure 2 was drawn using Basic Lightning, which stores its high-res screen under the Kernal at 57344 ($E000).

You can retrieve the high-res screen data from any memory block, but if you store your screen in the block starting at 49152 ($C000) it will overwrite Multi Dump!

See listing on page 102

Figure 1

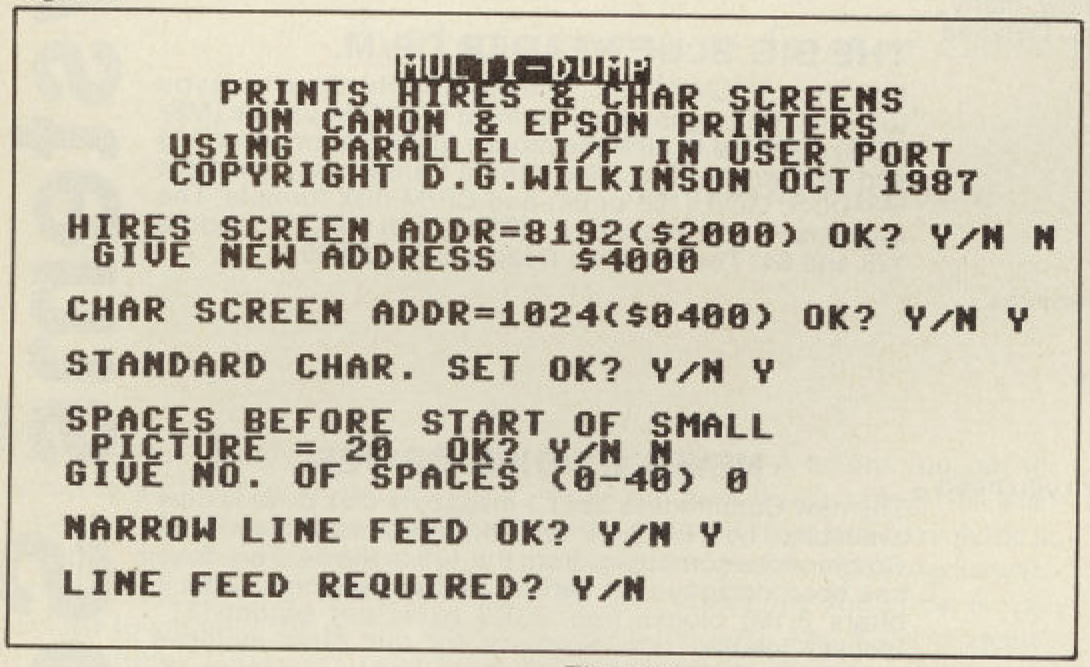
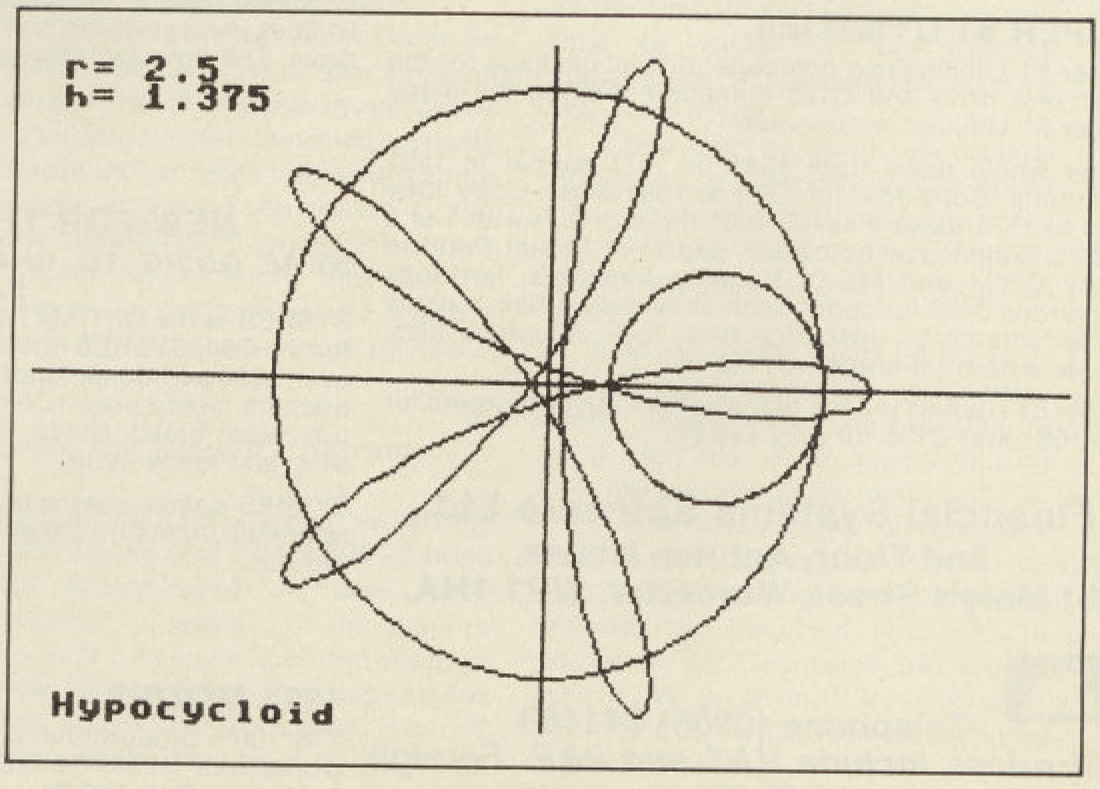


Figure 2



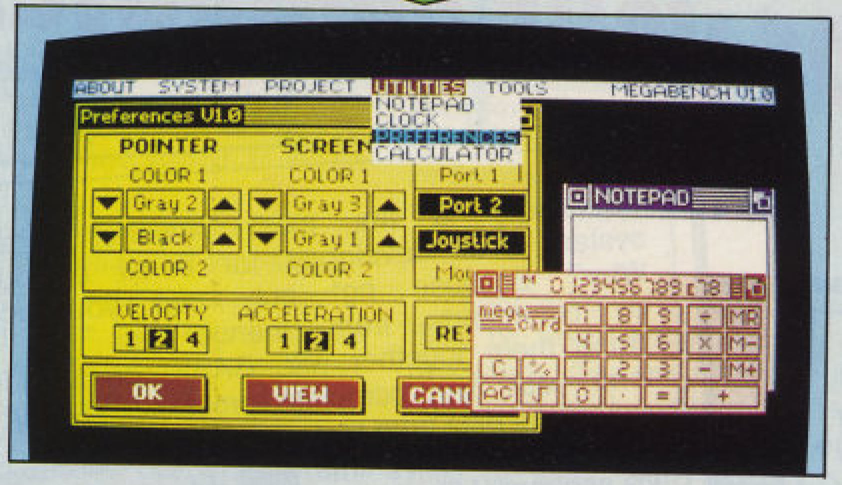
Simplifying Multi Dump

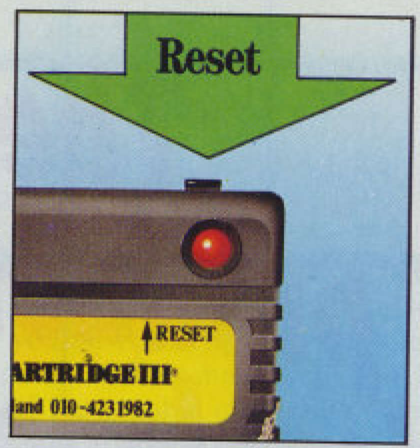
You can load and run programs 1 and 2 each time you want to use Multi Dump, but it is much more convenient to store the machine code as a program and load this automatically every time you run the set-up program.

To do this you need to modify the set-up program by loading it and adding the following lines:

```
30 A=A+1:IFA  1GOTO130
100 IFA  GOTO130
110 IFPEEK(52654)=27AND
PEEK(52655)=51GOTO130
and for tape users:
120 LOAD "MULTIDUMP/C"
or for disk users:
120 LOAD"MULTIDUMP/C",8,1
```

KEEP IT SIMPLE!









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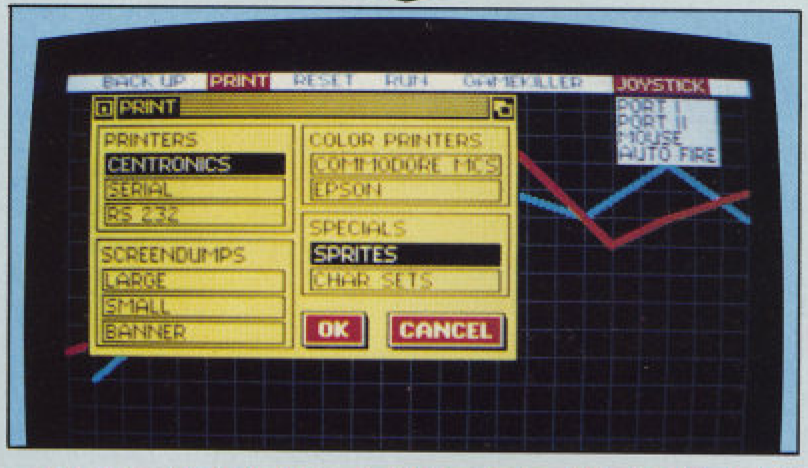
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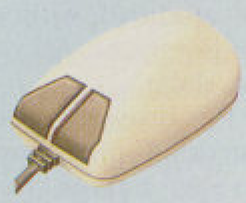
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Label Linker

Learn the secret of labelling for BASIC programs which allows easy appending of separate modules

By David Kelsey

Although BASIC 7.0 provides many excellent commands to allow structured programming, it leaves a little to be desired on the statements which provide line numbers. It is always a nuisance to have to guess the line number that you want.

Suppose you want to jump to a subroutine, which you haven't coded yet you must guess the line number that you think you might start coding at. Almost always, this is not the case.

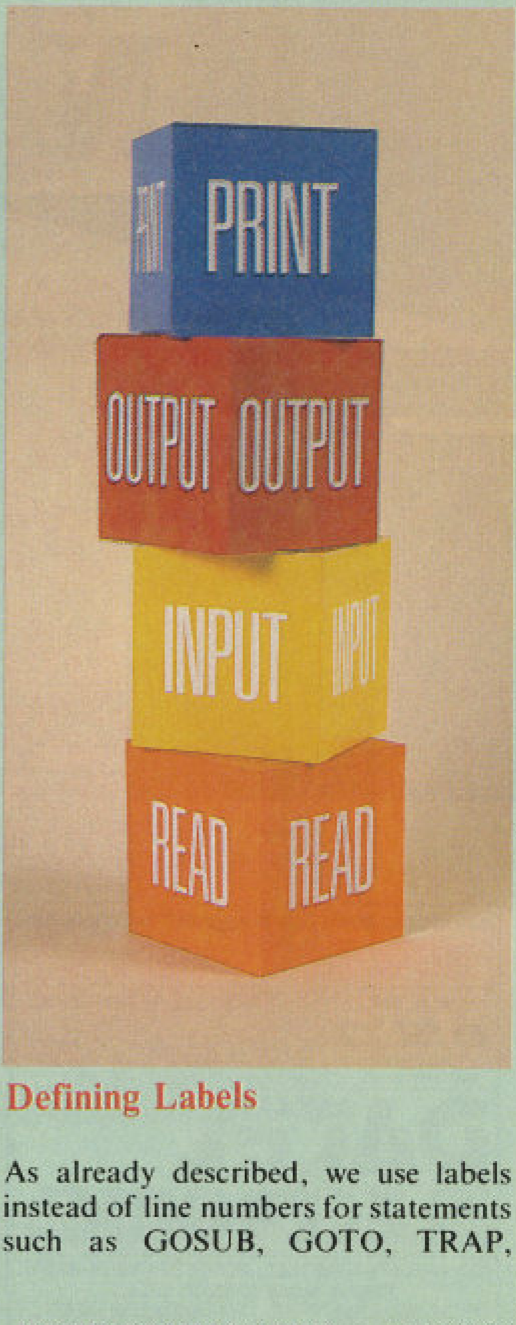
It would be so much easier to type 'GOSUB "CLEAR SCREEN" ', then later define the "CLEAR SCREEN" label to denote that the following code is where this GOSUB is pointing to.

Another useful feature would be if this subroutine wasn't actually in the main program, but was the name of another subroutine which was stored on disk or tape.

This would provide the user with the ability to call subroutines which had been previously written and tested without having to retype them in.

This would then allow libraries to be built, and if you update one of the library modules, all programs using it will be modified without having to alter all programs. All you have to do is relink them.

All this provides more facilities to do structured programming and to encourage better programming techniques.



Defining Labels

As already described, we use labels instead of line numbers for statements such as GOSUB, GOTO, TRAP, RESTORE etc. This is done by just replacing the line number with text. The text must be enclosed by inverted commas, e.g. GOSUB "TEST PRINT"

We also need a way to define which line numbers refer to labels, and this is done by using the REM statement. The following example shows how to define a label:

REM $"CLEAR SCREEN"

The text within the inverted commas is the label, and the $ signals the program that this text is a label.

There are restrictions put on labels, and the first of these is a label cannot be greater than 16 characters. Also you must define a label as you cannot just GOSUB"".

Linking

You can just have one program which uses labels referencing lines in other places within the same program, but the Label-Linker allows much more than that.

It provides the facility to join several separately saved programs and create one large BASIC program. Not only that, but you can reference a label from one program which has been defined in a totally separate program. This means however that you cannot use the same label name in two different program modules that you

want to join, as the Label-Linker will not know which one you are refering to. This process of joining is called LINKING.

The separate programs that are to be linked together need not neccesarily be complete programs, but could just be small subroutines or even just blocks of DATA statements. These programs are called MODULES.

The Label-Linker will require the names of the modules that you wish to link, and the order that you give them, will define the order of the final BASIC program.

There is one extra facility that the Label-Linker provides. If you have defined a subroutine, and saved it, instead of having to give the subroutine a label at the beginning of the routine, you can just reference this routine by using the name you have saved it under as the label name. For example, if the routine was saved under the name "CLEAR SCREEN", then all you have to do to call this routine would be to:

```
GOSUB "CLEAR SCREEN"
```

No 'REM $' line is needed in the routine.

"CLEAR SCREEN" is treated as a label, and so must be unique. An error would result if you have a line 'REM $ "CLEAR SCREEN"' in any of the program modules as well as a program name.

While coding a program using labels, it is still possible to renumber the program, but obviously any statements with a label will remain unchanged.

Below is a listing of this type of use. It has three separate modules which are described under their own headers.

"MAIN"

```
10      DIM A(20,15)
20      RESTORE "SCREEN
        DATA"
30      FOR L1= 0 TO 20
40      :FOR L2=0 to 15
50      : READ A(L1,L2)
60      : NEXT L2
70      NEXT L1
80      GOSUB "CLEAR SCREEN"
90      GOSUB "PRINTER INIT"
100     GOSUB "CALCULATE"
110     etc
5140    REM $"CALCULATE"
5150    etc
5200    RETURN
52100   etc
```

"SCREEN DATA"

```
10      DATA 192,193,155,etc
20      DATA etc
30      DATA etc
```

"PRINTER CONTROL"

```
10      ...
20      ..
30      ...
40      GOSUB "CALCULATE"
50      ...
60      ..
100     REM $"PRINTER INIT"
110     OPEN4,4,7
120     PRINT # 4
130     RETURN
140     REM $"PAGE ADVANCE"
150     ST$=CHR$(147)
160     GOSUB "PRINT ST$"
170     RETURN
```

"PRINT ST$"

```
10      PRINT # 4,ST$
20      PRINT#4
30      RETURN
```

Note that you can link program modules or just data modules. There is a danger with data statements. If you include a module which reads its own data statements, and you have another module which reads data statements, then there is the possibility that the modules could start reading from the wrong position or the wrong set of data statements. To deal with this situation, the RESTORE statement can be used to inform BASIC where to start reading from. The RESTORE statement also works with labels as shown in the above example.

Using the Label Linker

Type in the program 'DATA-LOADER', and save it under that name. Then type in the program 'BOOT.LOADER' and save it. Type RUN "BOOT.LOADER". The loader will generate the required program, and save it to disk under the name 'LABEL LINKER'. To then execute the label linker type... 'BLOAD "LABEL LINKER", B1:BANK1: SYS8192'

The Label Linker requires certain information. This will be prompted to you.

The questions are:

'Start address (1C01) ?'

This allows control of where the final BASIC program will be stored in memory. The practical use of this is to allow code programs to be stored in the lower half of memory, with the BASIC program above it. Then your BASIC program can tell these machine code routines. It also lets the user use memory not usually reserved for BASIC. (e.g. the section at $1300).

The default is the usual start of BASIC text '1C01'. Once you have saved the program, and reset the computer, if you use the DLOAD command, then the program will be re-loaded at wherever the BASIC start is, not at the address you may have linked it to. This won't affect the actual BASIC program, but it won't be in the part of memory you want it. To get over this, you can either re-direct the start of BASIC using the LOADER programs given, and load using DLOAD as usual, or you could use the BLOAD command, which will place it in the area in memory that you specified when running the Label-Linker. However, because BASIC hasn't been told where this program starts, it will either not recognise that it is there, or you will just get rubbish displayed when you try and LIST it:

'Display link map on scn or ptr (s/p)?

At the end of the linking, a link map is produced (this is explained later). This tells the system whether you want to output the map to the printer or screen.

If nothing is entered or an unrecognisable character is entered then the output is defaulted to the screen. From here, all that is required are the modules to be linked. The first prompt is:

'ENTER MAIN MODULE NAME >'

This asks for the main program controls and the use of the external subroutines.

The prompts are as follows:

'ENTER MODULE NAME >'

These are the names of the programs containing the subroutines. Just pressing enter on any of these prompts will start the Label-Linker processing, producing the final 'object' program.

Both the entries for 'MAIN MODULE' and 'MODULE' names are the same. If you just enter the filename, then it will try to load from disk, device 8. However the medium where the modules come from can be varied. A prefix can be given in the form of 'p:Filename', where 'p' is the device where the module comes from, and 'filename' is the name of the module to be included.

The following table gives the possible options for devices:

P	Device Number
a	disk device 8
b	disk device 9
c	disk device 10
d	disk device 11
t	tape device 1

It is possible to add devices onto this, and define your own prefixes, for example a virtual (RAM DISK) disk at device address 12 could be given a prefix of 'h'. This is described in the expansion section.

Note that whatever order you give the program names, they will have the same order in the final complete program.

When the Label-Linker replaces labels with line numbers, it doesn't necessarily replace it with the line number that the label is defined on. It replaces it with the first non-REM line number after the label, for example:

```
150  GOSUB "TEST PORT"< -----
```

This line is replaced by:

```
GOSUB 1090
1040 REM $"TEST PORT"
1050 REM THIS SECTON OF THE
1060 REM PROGRAM TESTS TO
SEE
1070 REM IF A PORT SIGNAL HAS
1080 REM HAS CHANGED.
1090 PP=PEEK(DEC("DD00"))
```

Link Map

This just gives some general information about what has been done. In the above coded program, the following link map would be produced:

Label Name	Type	Line No.
main	extrn	....
screen data	extrn	....
printer control	extrn	....
print st$	extrn	....
calculate	intrn	...,
printer init	intrn	....
page advance	intrn	....

The '....' just refers to the fact that a line number will be displayed. It doesn't matter for this example what they are.

The line numbers say what line number this label is replacing, not where the label definition can be found. Remember that when linking, the Label-Linker locates the first 'non-REM' line after the label definition.

Messages

The Label-Linker has a lot of error checking, and will display any relevant error messages. These are as follows:

device 'x' not present – this means that a device which has been assigned the prefix 'x' (x being just an example) is not communicating with the computer.

file 'example' on device 'x' does not exist – the file name example could not be loaded as the file couldn't be found. Or no disk is in device 'x'.

'x' has illegal device number – a prefix has been defined with a device number which isn't in input medium, e.g. you might have selected the device number for the screen. It isn't possible to load from the screen.

no memory left to load 'example' – all memory has been used up; cannot load this module, or any other module after it. You can either reduce the size of the program, or the BASIC start address.

unknown error on loading 'example' – the file 'example' could not be loaded due to some kind of error, not listed above.

line no. '11111' in module 'example' contains unresolved reference – the module 'example' could not be renumbered because the line '11111' has a statement which refers to a line number which doesn't exist in the module.

over 65535 lines in complete program, unable to continue – while joining the modules together, the number of lines so far exceeds the maximum possible in BASIC. Lines would have to be concatenated to reduce the number of lines in a module. (I would be very surprised if someone made this error.)

unable to update following line, too long – the line listed below cannot be updated because when the labels are replaced by line numbers, the line is too long to cope with. Another way this error could occur is if you have entered a line using the shorthand method, which allows longer lines to be entered. If this error does occur, then the offending line will have to be split into two separate lines. Also note that the line has been renumbered.

unable to update lines due to lack of memory – while trying to replace labels with line numbers, all of memory is used up. This is not easy to solve.

an unknown error has occurred during renumbering or trying to replace a line another error, not mentioned above has occurred (should never be displayed).

no label defined in line below – the line displayed has a statement which can have a label, but there are no characters within the inverted commas, e.g. GOTO "" will cause this error.

label too large (>16) in line below – a label has been defined or used which is greater than 16 characters.

label 'example' already defined – the label example has been defined at least twice. You are only allowed unique labels within the whole of the program. You cannot use the same label in different modules.

no line number, label or statement – a statement requiring a line number label or more statements, hasn't got any, e.g. 10 IF A=1 THEN

Label 'example' not defined – the label 'example' has not got a definition in any of the modules, i.e. there is no line with the statement REM $ "EXAMPLE"

Labeling Statements

The following statements can have labels instead of line numbers:

GOTO
GOSUB
ON GOTO
ON GOSUB
RESTORE
RESUME

Commands such as RUN, LIST etc CANNOT have labels, even if they are used within a BASIC program.

These commands can be expanded on. If new commands are added to the BASIC, then if these new commands use TOKEN crunching, then they can be added to the Label-Linker.

See the section on 'ABILITY TO UPGRADE' for further information.

Final Notes

During the time the Label-Linker is running, NEVER press RUN/STOP and RESTORE. If you have typed something wrong, or you just want the Linker to stop, then you will have to use the RESET button.

Another thing that you may find useful, is to set up the boot sector for the Label-Linker. To load, all you

would then have to type is 'BANK 1:BOOT'.

It is possible to have the Label-Linker permanently loaded, but you would have to redirect the start of BASIC variables to at least the address $3090.

The Label-Linker does its own renumbering, so when the program has been linked, you will find the line numbers in steps of 1, starting at 1. If this is not satisfactory, you can just RENUMBER the program.

Ability to Upgrade and Patches

As mentioned earlier, it is possible to upgrade this program to allow for extra devices or mediums for modules, and it is also possible for it to cope with extra commands which may also use line numbers. All the statements within BASIC 7.0 which use line numbers have been included, but if BASIC is expanded, then this program can cope with this. However, the new BASIC statements must be token crunched for this program to recognise it, and as one token labels are not possible in BASIC 7.0, then two token labels must be used. As the tokens $fe and $ce have to be used to their full extent, expansion has been based around the user of these. For example, if you add a new BASIC statement 'CALL', and when interpreted by the BASIC which has been modified, it is crunched to the tokens '$fe $44', then these values could be added to the Label-Linker such that if a label was placed after 'CALL' instead of a line number, then the Label-Linker will recognise it as a label, and replaced it with the appropriate line number.

A utility program has been provided to do this for you.

The Utility Program

The utility program has been supplied in separate modules for you to use the Label-Linker on.

Each program should be saved under the names given in the comment block at the start of each module. The four modules are:
UTIL.MAIN
UPDATE DEVICE
UPDATE COMMAND
TXTCNTL.MOD
(This is a simple text input and display module which could be modified and incorporated into your own programs if you wish.)

Run the Label-Linker as explained above. Press enter for the first prompt, and select screen or printer for the link-map. When prompted for the main module name type 'UTIL.MAIN' and press return. For other prompts, type in the following order:
UPDATE DEVICE (return)
UPDATE COMMAND (return)
TXTCNTL.MOD (return)
(return)

It should now say linking in process.

If all goes well, the messages 'pass 1' and 'pass 2' will be displayed, and then after a little while, the link map will be printed.
Save the program under the name 'LABEL-UTILITY'
Enter and save the program 'BOOT.UTIL'
To run the utility, type RUN "BOOT.UTIL"
A menu is displayed giving the options available.

The first option will let you change the device prefixes with their corresponding numbers.

The existing ones are displayed and the program prompts for a prefix. Once entered, you give the device number you want to correspond to that prefix.

If you enter a prefix which already exists, then the device number will be changed to the new one just entered. If you entered a new prefix, and there is room in the table, then it is added to the table, with its corresponding device number.

To exist this change, just press enter when prompted for prefix.

The next two options are used to update the Label-Linker to recognise new commands which have been wedged into the operating system. The way commands are stored in BASIC programs are in the form of special values. As BASIC 7.0 used all the single byte values possible for their commands, it had to use double bytes to define commands. The commands can be expanded on, using the same technique, but if a new command uses line numbers, then you may want the Label-Linker to know about these new commands.

The current table contents are displayed, and the program prompts for a command. The two commands are 'i' for insert, or 'd' for delete.

When either option is given, the program then prompts for a token. If possible, the program then tries to either insert or delete the token from the table. If it can't then a message is displayed saying what went wrong. To exist this screen, just press enter on the command line.

Option E ends the utility, and updates the Label-Linker. It renames the current version to 'OLDLINKER' deleting any previous copy, and puts the new version onto disk under the name 'LABEL-LINKER'.

Cassette Based Users

This program has been designed with disk users in mind, but should be possible to update the loader, and the BASIC programs for use with a cassette recorder. The main changes being the BLOAD, and the BSAVE commands. The BLOAD could be replaced with 'LOADF "",1,1' and specifiying the particular bank to be loaded.

BSAVE is a little more difficult. Either the monitor has to be used, or there may be ways of calling the save routine and specify the required parameters with BASIC, a programmers reference guide would be helpful.

Extra Program

Included also in this package, is a simple compactor program. It will remove all REMs and spaces from a program. For example it could be used to remove all the labels and the 'object' program by removing all REM statements if desired.

The loader is similar to the one used by the Label-Linker, and will require a 'boot.loader' program. Type in the loader, then save it under the name 'COMPACT.DATA'. Load in the program 'boot.loader', and change the 'DLOAD' command to 'DLOAD 'COMPACT.DATA'.

Once this is done, save the loader under the name 'BOOT.LOADER2'. To execute the program, just type 'RUN "BOOT.LOADER2"'. The loader will place the compactor in memory, then save a copy to disk under the name 'COMPACTOR'.

Using the Compactor

To load, type BLOAD 'COMPACTOR',B1
To remove just spaces, type 'BANK1: SYS28672,1,0'
To remove just REMs, type 'BANK1: SYS28672,0,1'
To remove both REMs and spaces, type 'BANK:SYS28672,1,1'
See listings on page 102 YC

Games Reviews

Check-up on the latest releases with our up-to-date reviews

Star Wars

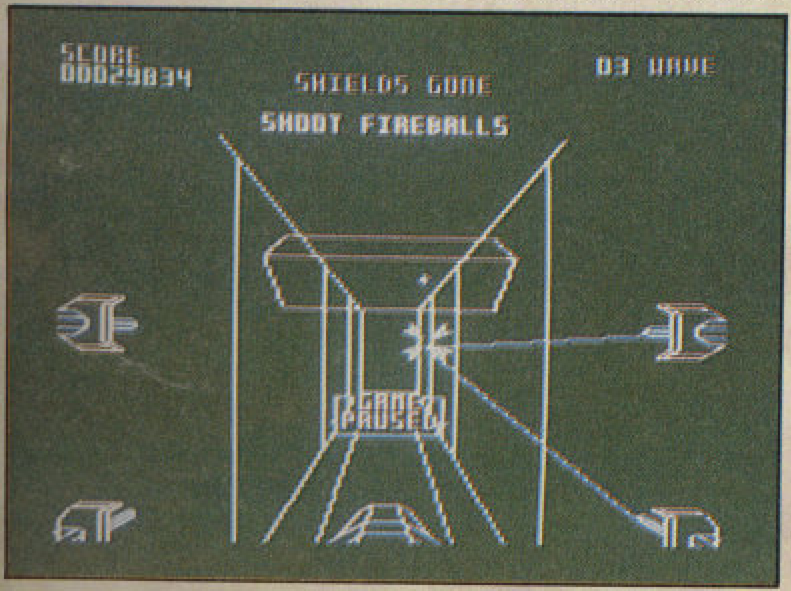
It's amazing how many of the Christmas games were based on arcade originals. Having drained as much as possible from Trivial Pursuit, Domark are now getting back into action games with Star Wars.

The game replays the closing scenes of the first Star Wars film as Luke Skywalker homes in on the Death Star to serve the coup de grace to the Empire's evil plans.

The game opens in deep space as Luke tackles the Tie-Fighters of Darth Vadar's fleet. There's nothing particularly innovative about this phase and the whole section strongly resembles an update on the old Startrek action screens.

Eventually the battered attackers make a run for cover and you can enter the second stage of the battle as you pick your way through the laser defence towers on the Death Star's surface. As you steer your X-Fighter through the forest of towers you have to blast the laser mounts on the top of each of them to pieces, in a poor man's Starglider scenario.

The final attack phase is the gauntlet run over and under the obstacles ranged along the trench which leads to the Death Star's exhaust port. Depositing a high explosive charge into the exhaust port at the end of the trench will finish the Empires war machine and complete the game.



The game isn't spectacularly innovative but its strength lies in the difficulty levels. There are three of these – for some unfathomable reason numbered 1, 3 and 5 – the lowest level is fairly easy and omits the tower challenge but the highest level is sure to get the adrenalin rushing about.

For me, Domark often fall short of the mark but if you want sweaty action you might like to give this a try.

A.C.E.

Touchline:

Title: *Star Wars.* ***Supplier:*** *Domark, 22 Hartfield Road, London SW19 3TA.* ***Tel:*** *01-947 5622.* ***Machine:*** *C64.* ***Price:*** *£9.95 (Ca) £12.95 (Disk).*

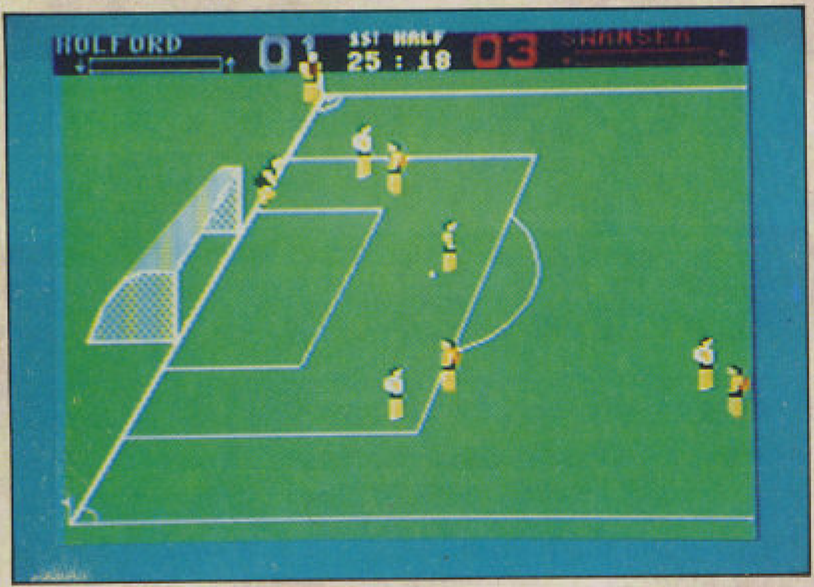
Originality: *3/10.* ***Playability:*** *7/10.* ***Graphics:*** *7/10.* ***Value:*** *6/10.*

Gary Lineker's Superstar Soccer

Football games seem to divide into two groups – you either play on the field where the International Soccer is King or watch from the sidelines in games like Football Manager. Gary Lineker's Superstar Soccer is set to change that as you not only select your team but also decide tactics and play either as the centre forward or the goalkeeper.

To play the full game you will have to buy a disk drive or be content with the severely cut down cassette version in which you only play the games themselves and miss out on runs in the cup, promotion and relegation battles and the chance to improve your squad by training, delving into the transfer marker or recruiting new players!

The cassette version does have all four league tables and starts you at the foot of the fourth but all you can do is play single games against human or computer opponents. These football matches are six aside games which can be speeded up to 15 times normal time. You can control either the



goalkeeper and hopefully make spectacular saves or lead the goal rush as the centre forward. The other four players are computer wingers and defenders whose actions depend on the tactics you select whenever the game stops because of a goal, halftime or a throw in, corner or goal kick. These tactics determine how much of the defence will push up to support the forwards and whether the computer players will pass to you, the centre or shoot at goal themselves.

To take a shot you simply hold and release the fire button when the gauge at the top of the screen shows the direction you want to shoot in. To pass you must tap the button and push the joystick in one of eight directions that determines whether you pass the ball to a specified player, the nearest player or to an area of the field. The fireworks really start flying when the ball is in the air as a press of the fire button will make your player leap to head the ball or even execute a perfect overhead scissors kick to send the ball flying past the keeper into the back of the net!

If you have the disk version then each game becomes more meaningful as a step nearer promotion or towards cup glory. You can select any team to play in either an English or American league and play 7 or 15 games each season even though there are 16 teams in each division.

To improve your chances you will need to strengthen your squad of ten players by trading them for more skillful players or spending some of your initial 250 trading points to send the entire team to a training camp or recruit a youngster and spend trading points to build up his skill. At the end of each season you'll receive more trading points depending on your achievements during the past year.

The object of the game is to win as many games, championships and cups as possible in nine seasons to achieve the highest possible rating. The complete disk version combines both football playing and management in a game for the first time that suffers only from snail-like disk access times. However, even with these considerable delays this is better than the cassette version that has been cut into oblivion and is like playing football with one leg tied behind your back! The marks below are for the disk version. Cassette owners should half the marks as they only get half the game! T.H.

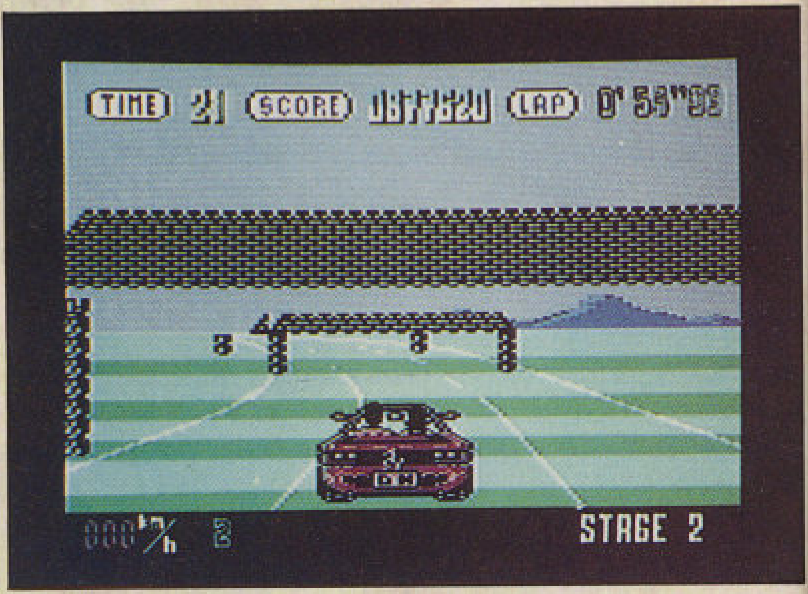
Touchline:
Title: *Gary Lineker's Superstar Soccer.* ***Supplier:*** *Gremlin Graphics, 10 Carver Street, Sheffield, S1 4FS.* ***Tel:*** *021-356 3377.* ***Machine:*** *C64.* ***Price:*** *£9.99 (Ca) £14.99 (Disk).*
Originality: *7/10.* ***Playability:*** *8/10.* ***Graphics:*** *5/10.* ***Value:*** *6/10.*

Out Run

Well, US Gold, you told us that this was the 1987 blockbuster, the Christmas number one program and other such hype. In the main you told the truth but there are probably many disappointed purchasers bored after a day's hard driving.

Out Run is certainly an impressive piece of programming but stripping away the original arcade game's high quality graphics and all-action console leaves a fairly average road racing game.

The conversion includes all five of the original routes but, once you've mastered the art of overtaking, most of the game is played with the accelerator hard on the floor and all you have to do is admire the scenery.



For real Out Run junkies there's a freebie audio tape from the original which resembles the musical wallpaper currently softening the sound of fast money being cashed up at the local hypermarket. Perhaps there's a hint of a Freudian slip in its inclusion with this package.

If you haven't seen Sega's Out Run – the arcade machine – it involves a cool dude in a hot red roadster with his seat cover by his side. After selecting a five section route he has to get through the traffic to complete each stage within a time limit to win the race and gain the adulation of the crowd.

This is accurately reproduced in the US Gold conversion but it lacks the spark of challenge and addictiveness to make it a worthy contender for the Number One slot. The programming has obviously been tackled with care to include as much detail from the original as is possible on the C64. Unfortunately, the compromises necessary to make it fit into the memory has not been compensated for and this leaves a feeling of nice program, shame about the game!

With Out Run we were promised great things but it's amazing how some promises produce things that grate. Out Run addicts may like to buy this as a memory of the great arcade game of 1986 but, like most memories, its's a poor substitute for the real experience. A.C.E.

Touchline:
Title: *Out Run.* ***Supplier:*** *US Gold Ltd, Units 2/3 Holford Way, Holford, Birmingham B6 7AX.* ***Tel:*** *021-356 3388.* ***Machine:*** *C64.* ***Price:*** *£9.95 (Ca) £14.95 (Disk).*
Originality; *4/10.* ***Playability:*** *3/10.* ***Graphics:*** *7/10.* ***Value:*** *4/10.*



PETER SHILTON'S HANDBALL MARADONA

Named after the "hand of God" incident during the England Argentina 1986 World Cup match, Peter Shilton's Handball Maradona gives you a new perspective of the football field. You've scored winning goals for your club and country, even managed your favourite team to league and cup glory and now here's your chance to save the day by wearing the number-one shirt.

You begin the game as a class "A" goalkeeper and have to build you way up to class "P" (for Peter Shilton?).

Once you have selected the team you're playing for you are presented with a menu that allows you to practice a few saves, play a game or try for a skill upgrading.

If you play a game you see your goal, which is badly defended by two useless defenders and between one and three opposing forwards. These players will pass or dribble the ball before they shoot at goal so you have to be ready for anything. You even have to save corners, free kicks and penalties. Pushing the joystick left and right will move your keeper across the goal with other directions sending him diving to all parts of your goal.

It will take some time for you to anticipate the forward's move, but when you do you'll save some of the eight shots at goal and your side will win. The result doesn't seem important and is mainly there for interest and to give you practice. Your most important task is to improve your skill rating.

Skill upgrading is harder than it seems as you have four shots to save but you fail as soon as you let one in. Succeed and you'll get a four digit code which you can enter when you load in the game another day, so you don't have to replay your hard fought levels.

Although there isn't much to the game (that's all folks) it is suprisingly addictive. **T.H.**

Touchline:
Title: Peter Shilton's Handball Maradona. ***Supplier:*** *Bug-Byte, Argus Press Software, Victory House, Leicester.* ***Tel:*** *01-439 0666.* ***Machine:*** *C64.* ***Price:*** *£1.99.*
Originality: *7/10.* ***Playability:*** *7/10.* ***Graphics:*** *6/10.* ***Value:*** *7/10.*

X-15 ALPHA MISSION

I've always had a weakness for vector graphic games, ever since I saw Star Wars in the arcade, and so I was delighted to see X-15 Alpha Mission on release. Although the graphics are nothing special, the game is none-the-less addictive.

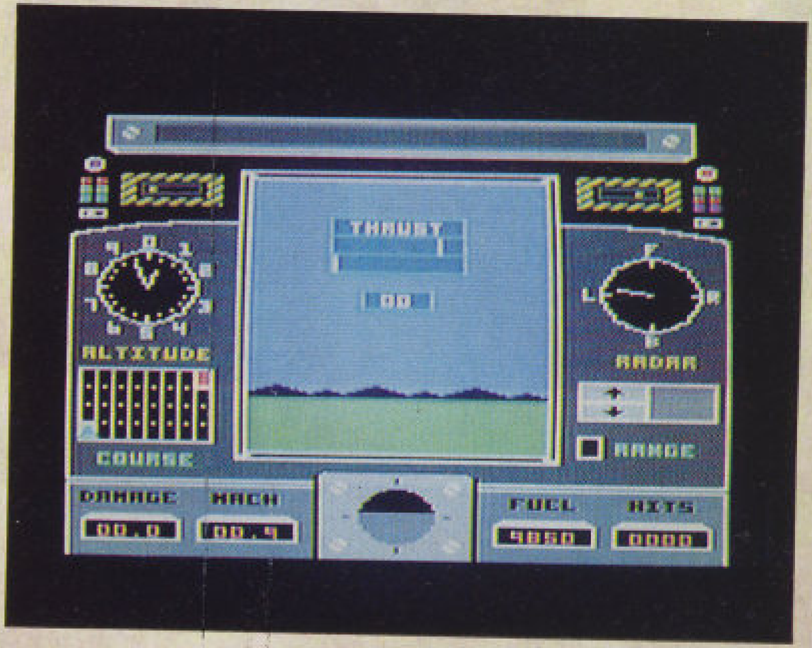
You play the part of a fighter pilot, who possesses great war tactics. NASA have started to receive strange messages that were bouncing off the Moon to Earth, which turned out to be ransom demands for huge sums of money. The threats were from terrorists, who were manning a space station, and would blow up major American cities and microwave President Reagan unless they were given the lolly.

Blowing up cities is okay, but microwaving President Reagan? You're sent to destroy the space station straight away.

At the start of the game you have to launch the ship into the sky which is quite easy and can soon be mastered. There are three levels of play that involve flying, the first being below cloud level, where you must shoot down helicopters and dodge nuclear missiles.

The second level takes you up into the clouds, where I became airsick, but soon got over it. You just shoot and dodge again, but this time it's against jet aircraft and kamakarzi gliders.

Finally we have space, where no one can hear you scream – hmmmm. Spaceships are now your enemy and will attempt to blow you apart. They look rather like tie-fighters from Star Wars, but then again, this is distributed by Lucas Films. Anyway, once you've blown up the tie-fighters you must then avoid asteroid belts and dock with the spacestation, where you have to enter a special code in order to access it. The code number is given at the beginning of each game, and changes each time you play.



When you have docked at the space station, a small capsual is released from your spacecraft and must be guided gently down onto the surface of the space station while avoiding the small meteors.

Once this is done and you have landed you can then begin your assault on the space station.

Eight robots emerge from your space-ship and you take control of each one in turn. There are eight different movements (functions) for the robots, but as they are not listed in the instructions, you will have to learn them off by

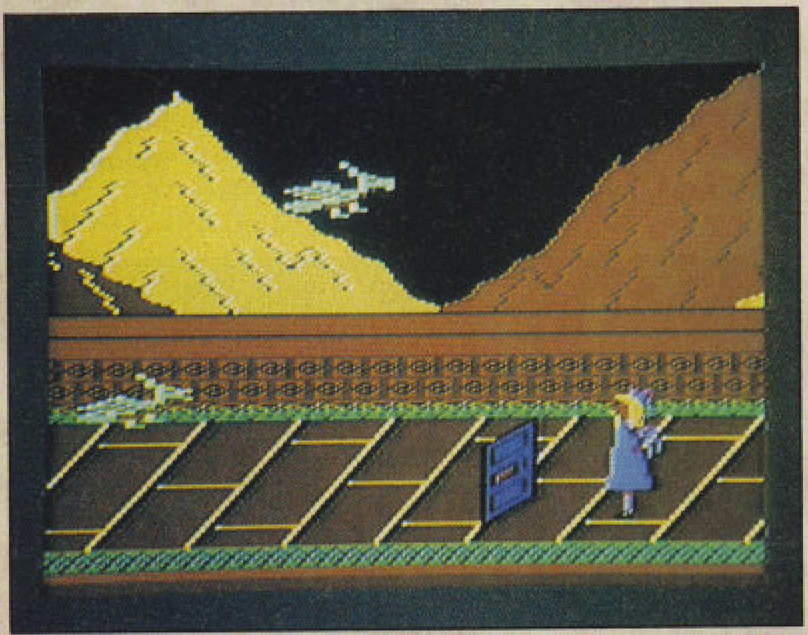
heart. These skills can be used to jump other robots and burn away rubble from the planet's surface or even self-destruct, but it is wise to do this only when you are near a weapons system, which are poles that stick out of the planet. You must destroy eight of these in order to blow up the space station, and as you can guess, you can't afford to lose any robots.

Phew, as you can see, there is a heck of a lot to do in this game, although going by its graphics, it is still pretty average looking, and the sound is nearly non-existant, but it's still a very playable game – take it from me. **K.R.**

Touchline:
Title: *X-15 Alpha Mission.* ***Supplier:*** *Activision, 23 Pond Street, Hampstead, London NW3 2PN.* ***Tel:*** *01-431 1101.* ***Machine:*** *C64.* ***Price:*** *£9.99.*
Graphics: *6/10.* ***Playability:*** *8/10.* ***Originality:*** *6/10.* ***Value:*** *7/10.*

ALICE IN WONDERLAND

Beware the Jabberwock my son, the Jaws that bite the claws that catch. Beware the Budget bird and shun this dubious Bug Byte catch!



I did think of starting this review with J'accuse in large capital letters as APS subsidiary Bug Byte appear to be trying it on and possibly contravening trading standards. Is this a rip off or is it a rip off?

It's golden oldie time at Bug Byte and they've dredged this one up from the days when the voice synthesis would be described as revolutionary and the graphics as stunning. Today it merely looks sad.

'Curiouser and curiouser', exclaims Alice at the beginning of the game and on finishing the first very, very dreary level the curiosity was revealed. This is not the Audiogenic multi-load cassette, it's (shock! horror!) the first part of the disk version! As Alice reaches the end of her perambulation along a dragon infested mountain road the screen incites player one to switch on his disk drive to load part 2.

Despite my efforts I could not find any scenes to match those depicted on the cassette insert, a possible case of misleading packaging, methinks.

The tawdry gameplay involves Alice on the mountain road being assailed by flimsy, ill-advised and ill-defined dragons who vanish into some dragonesque afterlife if they touch her. Every now and again the dragons change colour to herald the arrival of the Jabberwock. After the next colour change Jabberwock arrives looking like a fearsome cockatoo and far less dangerous. Now is the time the dragons have waited for as they home in to devour one of Alice's six lives unless Alice gets the Jabberwock first. Wow!

Even less frequently, wandering doors travel across the screen. If Alice fails to jump over a door she's whisked back to the start of her walk. Gasp!

Come off it APS. Try and pull the wool over someone else's eyes. Malice in Videoland is a video nasty; avoid it at all costs but let the Mad Hatter and his friends have the last say:

'This piece of rudeness was more than Alice could bear: she got up in great disgust, and walked off; the Dormouse fell asleep instantly and neither of the others took the least notice. . .'

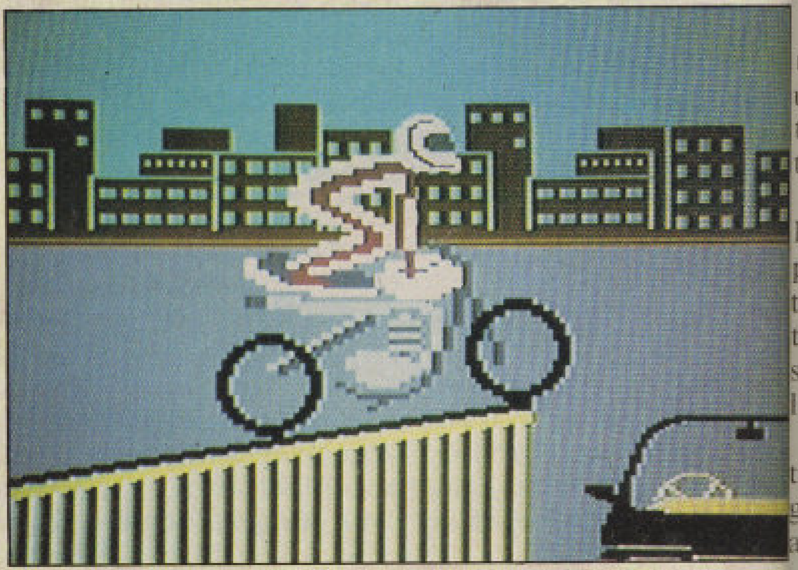
E.D.

Touchline:
Name: *Alice in Videoland.* ***Supplier:*** *Bug Byte, Victory House, Leicester Place, London WC2H 7NB.* ***Tel:*** *01-439 0666.* ***Machine:*** *C64.* ***Price:*** *£2.99.*
Originality: *0/10.* ***Playability:*** *1/10.* ***Graphics:*** *3/10.* ***Value:*** *1/10.*

EDDIE KIDD'S JUMP CHALLENGE

My best advice is not to buy it. This game refuses to lie down and die. . .sorry, it refuses to lie down; it died a long time ago.

The mature principle of this game is to ride a motorbike up a ramp and jump over a row of cars. I always understood the principle of acceleration to be one of steadily increasing momentum. Obviously I was mislead by my physics teacher, as according to this game, acceleration is one of steadily



increasing noise. As Eddie 'speeds up' the background passes by at the same constant rate and goes on and on and on...

An age later you meet the ramp, take off, and fight to control the altitude of the bike to make a safe landing. If you fail, Eddie limps off the screen and you're back at the start of your run up.

If Eddie Kidd is a modern day Rocker, then Ricochet seems to have gone off theirs with this escapee (surely it's not a release!). Martech must be laughing all the way to the bank after off-loading this pile of tripe onto Mastertronic.

E.D.

Touchline:

Name: *Eddie Kidd's Jump Challenge.* ***Suppliers:*** *Ricochet, 8-10 Paul Street, London EC24 4JH.* ***Tel:*** *01-377 6880* ***Machine:*** *C64.* ***Price:*** *£2.99.*
Originality: *1/10.* ***Playability:*** *0/10.* ***Graphics:*** *1/10.* ***Value:*** *1/10.*



ARCADE CLASSICS

They say that nostalgia isn't what it used to be. Was it really that long ago that we gasped with amazement at delights such as Space Invaders and Asteroids?

For any of you who have forgotten what computer games used to look like, Firebird have assembled four different classic titles in one game.

Space Invaders is the daddy of all shoot-em-ups. Left, right and fire are the basic controls, as you dodge from under the barricades to wipe out row after row of aliens as they pursue their ever-relentless path down the screen towards you.

Big fleas have little fleas upon their backs to bite 'em. Little fleas have littler fleas and so *ad infinitum* – the basic principle of Asteroids. You are trapped in a giant storm of these huge space boulders, and as you shoot at the rocks they break up into medium sized rocks which in turn become small rocks. Contact with any of them, not surprisingly, is lethal.

The other two games are, somewhat disappointingly, two player games. Surely there were enough one player games around or, failing that, computer opponents available. Snakes is an attempt to make your opponent crash into you or move back on himself, before he does likewise to you, and Space War is a variation on the same theme except that you must also avoid the sun's gravitational pull.

Four games for two quid seems to be great value for money but the games are extremely crude by today's standards, even if they are fair copies of the originals. Unless you are desperate for one of these oldies to complete your collection, stay well away.

G.R.H.

Touchline:

Title: *Aracde Classics.* ***Supplier:*** *Firebird Silver, First Floor, 64-67 New Oxford Street,London WC1A 1PS.* ***Tel:*** *01-379 6755.* ***Machine:*** *C64.* ***Price:*** *£1.99.*
Originality: *1/10.* ***Graphics:*** *2/10.* ***Playability:*** *6/10.* ***Value:*** *3/10.*

COIN-OP CLASSICS

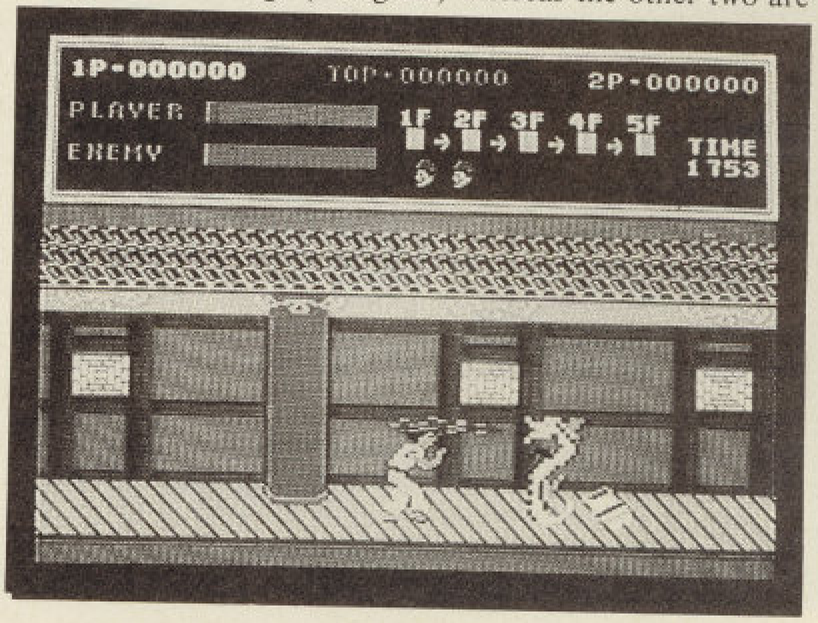
In this age of compilations, US Gold have bundled three of their coin-op conversions together for the price of one game.

Kung-Fu Master is, as you might suspect, a martial arts beat-em-up. As usual, there is a princess who has got herself captured, and it is up to you to organise a rescue. Various henchmen block your way together with fire breathing dragons, killer bees, psychopathic dwarves and exploding vases. If you make your way to the end of a level, a final confrontation with a guardian is all that stops your progress. This is a reasonable game of its type, despite some blocky graphics.

Breakthru sees you trying to penetrate 400 miles behind enemy lines in order to rescue one of your country's top secret agents. You are armed only with a jeep but it does have the advantage that it can fly and jump short distances. There are five different terrains for you to cross should you accept the mission.

Crystal Castles is, despite the hype accompanying it, no more than a glorified Pacman derivative. Bentley Bear must collect gems while avoiding the various nasties. There are tunnels and lifts which can aid or hinder you.

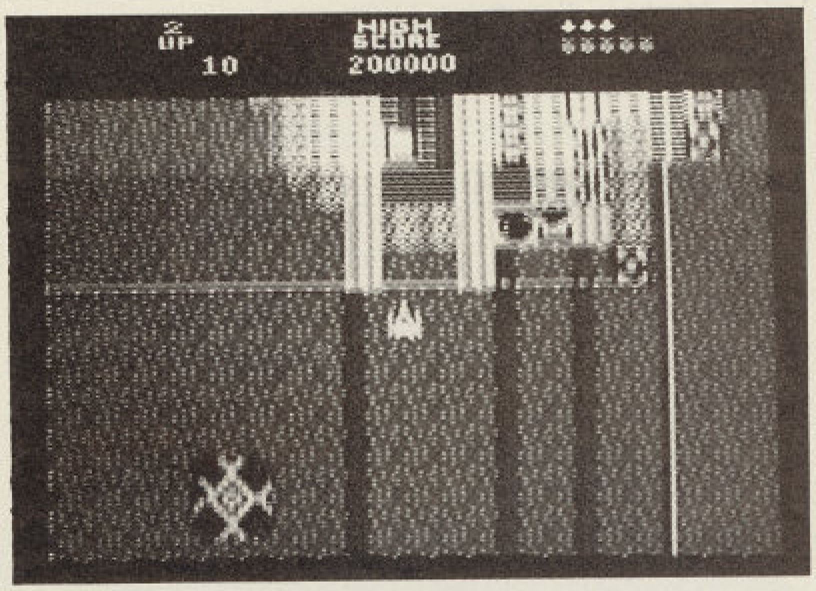
Although compilations appear to be good value for money, you have to watch what you are getting. Here, only one game is average (Kung Fu) whereas the other two are



downright awful. If you were keen on the arcade originals, then you might consider buying this but otherwise, I suggest you give it a wide berth.

G.R.H.

Touchline:
Title: *Coin-op Classics.* ***Supplier:*** *US Gold Ltd, Unit 2/3 Holford Way, Holford, Birmingham B6 7AX.* ***Tel:*** *021-356 3388.* ***Machine:*** *C64.* ***Price:*** *£9.99.*
Originality: *3/10.* ***Playability:*** *4/10.* ***Graphics:*** *4/10.* ***Value:*** *3/10.*



THE LAST MISSION

Zzzzzzzzzzz. zz,zzz, yawn, oh, hello, sorry about that I've just been playing The Last Mission, the latest conversion from US Gold.

The story has it that you are an outcast, driven from your home galaxy – why I don't know. Anyway it goes on to say that you must return to your home, blow up the aliens that are trying to take over your homestead. If you do this you will no longer have to live in exile, you would be a hero. So how can you refuse – you jump into your super-star fighter and zoom off to your home planet.

On arrival you discover that you have zoomed into a really poor arcade conversion. Your home looks like it's made out of lego bricks and the space ships are bland and small, but the music that your on-board computer is playing is quite good.

Scattered around the planets are various silos which when shot release a powerful weapon of some kind – simply fly over these to pick them up, then it will be fitted to your ship.

I cannot recommend this at £9.99, it just isn't up to scratch. It could be different if it was a budget game, but as it stands I would leave well alone.

K.K.

Touchline:
Title: *The Last Mission.* ***Supplier:*** *US Gold, Units 2.3 Holford Way, Holford, Birmingham B6 4AX.* ***Tel:*** *021-356 3388.* ***Machine:*** *C64.* ***Price:*** *£9.99 (Ca)/£14.99 (Disk).*
Originality: *5/10.* ***Playability:*** *4/10.* ***Graphics:*** *5/10.* ***Value:*** *3/10.*

SWAMP FEVER

David Bellamy may get into some scrapes but never as bad as this. Professor Oddbod has taken on the mission to recover as many rare Aisuru flowers as possible from the irradiated swamps of Florida.

The radiation has mutated the swampland creatures into man-eating monsters with a penchant for professors. Armed only with a flamethrower the professor has to fight his way through 35 swampy screens picking flowers as he goes.

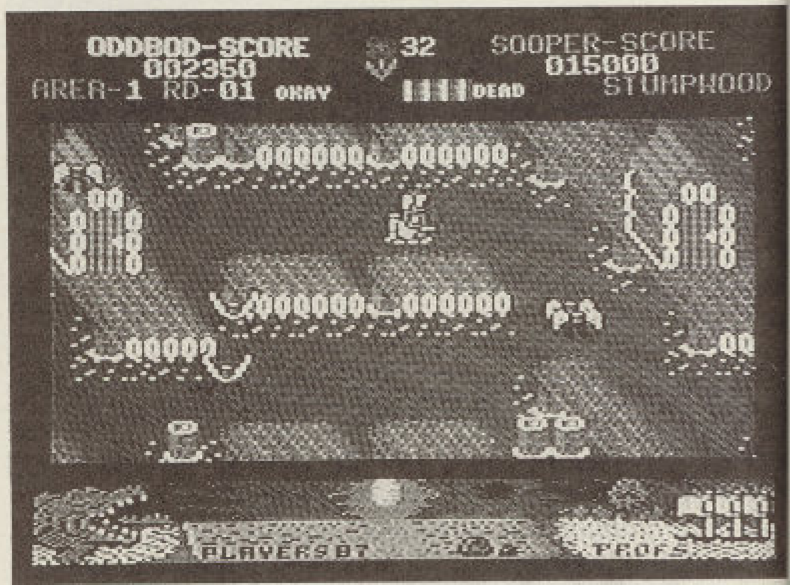
Every now and again the swamp fever infected creatures swarm around the professor and he has to flee onto a neighbouring swamp to free himself of the threat.

The scenario seems quite respectable but the game itself is awful. What programming there is has been proficiently executed, but each swamp maze falls into one of two types each variation round these limited themes differing only in graphics design. The two basic maps of the maze do not seem to vary at all.

Players have basically ended up with a two screen game with very limited action. Even at budget price this is an extremely disappointing product.

E.D.

Touchline:
Name: *Swamp Fever.* ***Supplier:*** *Players.* ***Tel:*** *07356 71500.* ***Machine:*** *C64.* ***Price:*** *£1.99.*
Originality: *1/10.* ***Playability:*** *3/10.* ***Graphics:*** *3/10.* ***Value:*** *2/10.*



PIR SQUARED

Well, I expected another run-of-the-mill arcade game that was nothing to write home about, but I was pleasantly surprised with this recent release from Argus Press. The first thing that struck me about the game was the colourful and well-drawn loading screen, but I still remained sceptical. As the game loaded, rather a nice tune played, and growing curious I started the game. I found it to be a highly playable addictive arcade game that was also quite frustrating.

You play Professor Brain Storm who is just about to appear on TV to give a lecture on geometric solids. So there you are feeling pretty confident when suddenly your mind

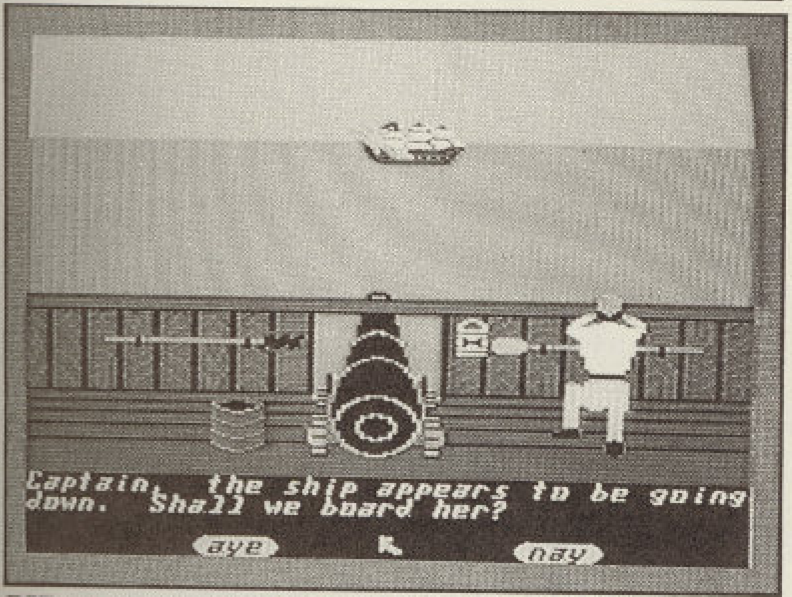
begins to wander. What lousy timing – the credits are beginning to roll and the intro. music playing and your standing there daydreaming. "Oh no, it's happening again," it must be nerves as now poor old Prof. can hardly remember his own name, let alone a formula. However hard he tries to think he can't get back to normal. All hope is not yet lost however as there's now a chance for Prof. to reconstruct his memory, and hopefully recover the formulas.

That's where you come in – move around the cogs and wheels of the Prof's brain, recovering the lost formulas and collecting various other useful items such as calculators which increase your speed. As well as useful aids, there are also objects which hinder you (stray thoughts) like ice cream and naked women (you fibber: ED).

So there you have it, a pretty enjoyable game from Argus Press Software, but I feel the asking price is a little too expensive at just under a tenner. If you are rich go and buy it, if not have a look at it if you can. **K.R.**

Touchline:

Title: *PIR Squared.* ***Supplier:*** *Argus Press Software, Victory House, Leicester Place, London, WC2H 7NB.* ***Tel:*** *01-439 0666.* ***Price:*** *£8.99 (Ca) £12.99 (Disk).* ***Machine:*** *C64.* ***Graphics:*** *6/10.* ***Originality:*** *8/10.* ***Playability:*** *7/10.* ***Value:*** *6/10.*



PIRATES OF THE BARBARY COAST

Your daughter has been kidnapped and is being held to ransom by the evil Pirate Bloodthroat. You have thirty days to come up with 50,000 gold pieces or else.

You have two main courses of action available to you. You can try and raise the money by buying and selling goods along the North African coast and you can try and find the secret lair of Bloodthroat and destroy him.

The game is a combination of strategy and action. Starting off in a friendly port, you have to hire and fire crew, keep them fed and juggle the supplies within your hold, haggling with merchants for the best prices. If your ship is damaged, you can take the opportunity to get it repaired for payment of the appropriate amount of gold. Choose your destination and set sail.

Once at sea, you have to prime your cannon ready for any potential action. This involves selecting which of the fifteen guns are to be loaded and following a set pattern of inserting the powder, tamping it down, putting in the ball, etc. If all goes well, the cannon indicators change colour. Get the sequence wrong and you have to start all over again.

When in combat, you will need to find the right elevation for your guns with a few test shots before moving along the row of cannon trying to sink the enemy. Of course, he is trying to do the same to you and any hits by him will result in your crew falling by their guns. If you succeed in defeating the enemy, you get the chance to plunder for information or gold, but not both.

Despite the large colourful graphics, the game is slow to play and a little difficult to control despite being icon/menu driven. If you are looking for a strategy game, then Pirates from Microprose is infinitely better. If it is action that you want, again, there are better games on the market. Pirates of the Barbary Coast seems to fall between two stools.

G.R.H.

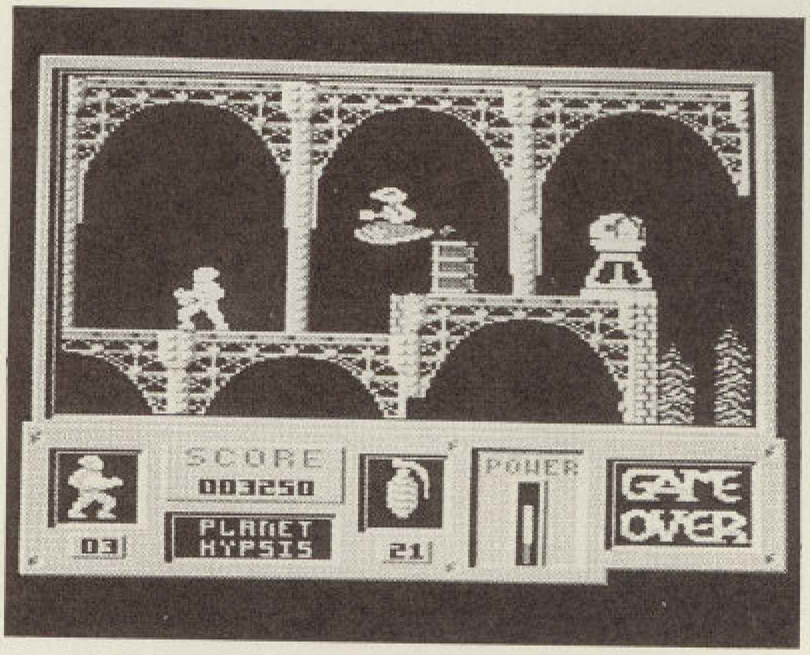
Touchline:
Title: *Pirates of the Barbary Coast.* ***Supplier:*** *Cascade Games Ltd, 1-3 Haywra Crescent, Harrogate, North Yorkshire HG1 5BG.* ***Tel:*** *0423 525325.* ***Machine:*** *C64 – disk only.* ***Price:*** *£14.99*
Originality: *7/10.* ***Playability:*** *4/10.* ***Graphics:*** *9/10.* ***Value:*** *5/10.*

GAME OVER

What an original title, Game Over – it's clever, yet so simple. I bet loads of software houses are kicking themselves saying 'why didn't we think of a title like that?'

But what is the game like? Well, I can assure you, you will not be disappointed. You play Arkos who lives far away in a distant galaxy and is a faithful servant to the Beautiful but totally evil Gremla. Arkos is a ruthless cyborg-type being, who used to follow Gremla's every command, but as her power grew so did her greed, and now Arkos can take no more.

He joined the rebel forces in a plot to overthrow her and



to destroy her palace for good.

When the attack was agreed, Arkos decided it would be best if he went alone, after all, he knew the route to the palace and could fight better than any mortal. The other rebels agreed and Arkos set forward to rid the planet of the evil Gremla. Kill everything that gets in your way, and anything that doesn't!

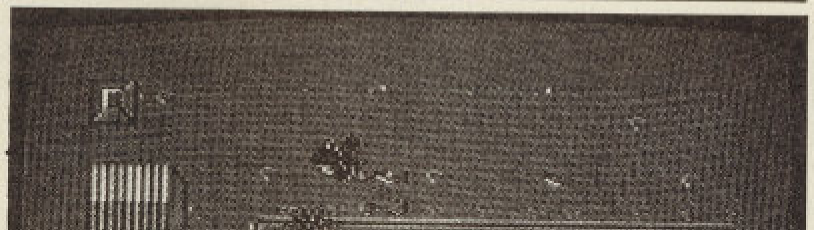
The game comes in two parts; the first being the planet Hypsis. This is the easy part as you only need to reach the 11th screen to confront and kill the mighty Orko, who was once your friend and is now your worst enemy, and must be shot many times before he dies.. Progress will not be granted until he is dead.

To aid you on your quest you will find red barrels, which must be shot three times to unleash their contents. Some contain various weapons and power hearts, but there is a chance that a mine lies inside so you have to watch your step as the mines are very deadly. They can only be passed by wearing a field of force (also found in the barrels) or jumped, but this may be impossible in some situations.

The backdrops and aliens are very nicely drawn and this makes the game a lot more playable, however you may soon find yourself cursing this game as it can sometimes prove very hard, and especially frustrating. That said, it is still a nicely presented game that plays reasonably well with some nice sound and spot effects thrown in. However, it could have been improved with in-game music and better control of the main character, but you can't have everything can you?

K.R.

Touchline:
Title: *Game Over.* ***Supplier:*** *Imagine, 6 Central Street, Manchester, M2 SN5.* ***Tel:*** *061-832 6633.* ***Price:*** *£8.99.*
Originality: *6/10.* ***Playability:*** *7/10.* ***Graphics:*** *8/10.* ***Value:*** *6/10.*



REBEL

This new game from Virgin has a really good story line; try and imagine this. You are forced to work for a plantation centre, where the shifts are long and hard, and no-one knows what the word cry means and when you reach just over thirty you are terminated – not very nice, huh?

The new plantation supervisor has decided to try and improve production, which he does by creating a workforce of zombies. Sleep is controlled by him, and you sleep in a special chamber which makes you sleep and wake up in the morning. There are countless pills to be taken but these do nothing much, just slow your brain down – they are known as the Tanq-u-pills and they slowly take away your resistance. Our hero has managed to stop taking these pills and now realises the danger.

This is where you step in; you have to guide a tank containing our hero, around the giant base switching the solar panels so they will direct the power beam into a selected wall on each level. When you are satisfied with this, fire the lazer beam and hope you got it right. If you do you'll go onto the next level, if not you'll lose a life.

As you advance through the levels, the backdrops change but that's about it, you will get the same aliens, same task, and so after a while you may find yourself getting bored. This is a shame as the game has some wonderful graphics, but stumbles on the gameplay side. If this had been a fiver or less it would have been good, but at just under a tenner it's not really very good value.

K.R.

Touchline:
Title: *Rebel.* ***Supplier:*** *Virgin 2-4 Vernon Road, Portobello Road, London W11 2DX.* ***Telephone:*** *01-727 8070.*
Originality: *4/10.* ***Playability:*** *6/10.* ***Graphics:*** *7/10.* ***Value:*** *4/10.*

NICK FALDO

Here's your chance to hack your way through the rough and bunkers of the Royal St. Georges course in Sandwich.

An icon drive golf game, you must select your club (and suffer the sarcastic comments of your caddy should your choice differ from his own not so humble opinion), direction and strength of the shot. Your player lines up the shot automatically and wacks the ball according to your predetermined instructions.

The upper portion of the screen gives a top down view of the hole and if like me, your shots are nowhere near the fairway, you can call up a map of the surrounding area to show where you are in relation to the green.

All is well until you actually land on the green and your ball is lying a couple of feet from the hole. Distinguishing between the hole and ball becomes next to imposible and I have actually putted six from a short distance.

This would have been a reasonable if somewhat simplistic simulation but for the putting fiasco. If you want a really good golf game, then save your money and buy World Class Leaderboard instead.

G.R.H.

Touchline:
Title: *Nick Faldo Plays The Open.* ***Supplier:*** *Bug-Byte, Victory House, Leicester Place, London WC2H 7NB.* ***Tel:*** *01-439 0666.* ***Machine:*** *C64.* ***Price:*** *£2.99.*
Originality: *3/10.* ***Playability:*** *3/10.* ***Graphics:*** *4/10.* ***Value:*** *3/10.*

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Amiga News

Find out what's been happening in the Amiga world



A 20Mbyte SupraDrive hard disk unit

Hard News

A new series of Amiga compatible hard disk systems have been launched in the USA by the Supra Corporation. The high performance systems incorporate a hard disk drive in one of four capacities, SCSI expansion port and provide RAM expansion capabilities.

The four drives have 20, 30 60 and 250 Mbyte capacities and retail in the States at $995, $1195, $1995 and $3995 respectively.

The SupraDrives plug directly into the Amiga 500 expansion socket and feature Supra's own high speed data transfer interface. Burst date transfer speeds of 250Kbytes per second can be achieved to complement the fast seeking hard drives.

RAM boards of 1 or 2Mbyte capacity can be plugged into the hard disk units and the separate power supply of the units is used to power the expansion boards to avoid overloading the Amiga.

New Lasers

Two new laser printers are ready for launch from Brother and Star Micronics.

The Brother HL-8 has a printout speed of eight pages per minute. Access to five resident fonts may be supplemented through two front cartridge slots making it suitable for desktop publishing applications.

The speed of the Brother machine is matched by Star's LaserPrinter 8. There are eight fonts resident in the machine, cartridge expansion capability and user definable characters can be specified at the cost of a small part of the internal 1Mbyte memory. LaserPrinter 8 can operate in both landscape and portrait formats and up to 64 different fonts can be included on a single tape.

Despite all of these facilities the price has been kept to a relatively low £2,195 including a year's on-site parts and labour warranty.

Touchline:

Brother Computer Peripherals Division: *Jones+Brother, Shepley Street, Guide Bridge, Audenshaw, Manchester M34 5JD.* ***Tel:*** *061-330 6531.*

Star Micronics UK: *Craven House, 40 Uxbridge Road, Ealing, London W5 2BS.* ***Tel:*** *01-840 1800.*

CRL's Amiga Range

CRL have announced their plans to release three new games for the Amiga: Blackshadow, Tau Ceti and Academy.

In Blackshadow you command a spacecraft which flies over a vast, heavily armed asteroid. After running the gauntlet of defence systems, knocking out as many of the weapons as possible, the final target on each level has to be destroyed.

Tau Ceti and Academy have already been seen on the C64 but the Amiga versions promise extra excitement and realism.

Tau Ceti takes place on a decimated planet and your mission is to close down the malfunctioning systems which have defied all attempts to previous adventurers. In realistic 3D vector graphics, you must search the cities in your skimmer craft and collect the rods which are needed to shut down the massive fission reactor which fuels the planet.

Academy is the follow up to Tau Ceti which allows you to design your own skimmer. After graduating from the Academy, you are able to tackle one of 20 missions bust success will rely on the design of your skimmer.

All three CRL games have a retail price of £19.95.

Touchline:

CRL: *CRL House, 9 King's Yard, Carpenters Road, London E15 2HD.* ***Tel:*** *01-533 2918.*

Continued on page 37

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Ron (left) and Jean Baker receive their prize from John Speller, MD of MicroPro International

Wonderful WordStar

Celebrations were called for when MicroPro passed the three million sales figure for their WordStar package. The crucial landmark was due to be released in late 1987, so a special promotion was embarked upon with the promise of a fantastic Far Eastern holiday for the lucky purchaser of the three millionth copy of the wordprocessor.

The actual purchaser of the momentous package could not be accurately assessed so anyone buying their copy of WordStar during September and October became eligible for the Celebration Draw made at London's Hurlinagham Club on November 27th.

The lucky recipient of the first prize was Ron Baker of Romford. Ron works for British Telecom International as an implementation and design engineer and it was in this capacity that he registered the software on BTI's behalf. The prize is a holiday for two which he will share with his wife, Jean.

The second prize, a compact disk player, was won by Allan Green from the Department of Physics at Queen Elizabeth's Hospital, Edgbaston. An Olympus Trip camera formed the third prize awarded to Julian Wates, Senior Lecturer in charge of Computing at North Hertfordshire College.

The three million sales figure in less than a decade by MicroPro is stunning when seen on a daily sales basis. To reach this volume of sales, almost 1000 WordStar units will have been shipped out every day! Perhaps we'll see the four millionth sales in May or June 1990.

Touchline:
MicroPro International: *Haygarth House, 28/31 High Street, Wimbledon Village, London SW19 5BY.* ***Tel:*** *01-879 1122.*

Invisible Arts Package

The Amiga notched up another TV success before the end of 1987 when Channel 4's Eleventh Hour sereis presented Gorilla Tape Productions' programme Invisible TV featuring effects generated on an Amiga running Electronic Art's DeluxePaint II.

IVT, a fictitious TV station, was used as a vehicle to expose the 'propoganda' which veils itself in the guise of popular entertainment. The message was spread by using examples of a typical day's broadcasting in which different types of programmes were all given the hip hop scratch treatment.

Special effects were created by computer graphic artist Gary Whiteley who has used the Amiga in several previous productions as a suitable alternative to graphics production equipment costing many times that of the computer. DeluxePaint II provided a suitable environment for the production of the extraordinary effects which Whiteley visualised.

Touchline:
Electronic Arts:*Langley Business Centre, 11-49 Station Road, Langley, Berkshire SL3 8YN.* ***Tel:*** *0753 49442.*

ProWrite Update

A new version of ProWrite – V2.0 – is available which has many added features. Of special interest is the self selection default specifications. All start up parameters such as font, justification, spacing and colours can be predetermined and several preference files can be stored and loaded whenever required.

Graphics and text dumps have been greatly improved giving speeds which may reach ten times that of previous versions. In text mode the program will run as fast as the printer will allow. High resolution printers can be fed with a smoothed output which permits true letter quality printouts from any of the Amiga fonts.

Printouts can be set to any width through ProWrite 2.0 using the sideways printing capability for extra wide paper.

HAM pictures, such as those created with DigiPaint, can be loaded into ProWrite and resized.

Paragraph formatting options have been incorporated to allow one and a half spacing, fixed line height and the inclusion of a blank separating line between each paragraph. The finished paragraphs can be sorted into ascending or descending order to assist in creating a table or for editing the custom user dictionary which complements the fixed 95,000 word spelling checker.

Character, word, sentence, paragraph, picture and page counts can be easily accessed for full document information readouts.

These are just the main improvements, many more alterations and find tunings have been incorporated to increase the power of this vastly improved product from New Horizons Software.

Touchline:

New Horizons Software: *P.O. Box 43167, Austin, Texax, 78745.* ***Tel:*** *010-512 328 6650.*

Amiga Gossip

The recent news about virus disks has set the Amiga world jittering with fear, one software producer told me that nearly 40% of his disks were "infectd" with a virus that occasionally popped up with the message "YOUR MACHINE HAS BEEN INFECTED".

In America – where the virus is believed to have first started – there are no less than three major disk infestations – all of which recognise the other viruses and react accordingly. For instance, one disk virus forces another (found in DEC USA – Palo Alto) to pop up with the message "A Virus... Yummy! Dinner Time"

This ain't funny anymore

I was recently talking to Darryl Mays, a British software programmer hoping to start breaking into the Amiga Software scene with "Antrax" (or should that be Anthrax?), he was grieving about the the fact that one of these viruses got in the way of his custom disk protection system, his fear as that unless you switch the Amiga off between every disk swap, the chances are quite high that a similarly protected disk will get fiddled around with, thus rendering it useless.

Amiga Wars

In a meeting, George Lucas was reportedly asked if he had considered supporting the Amiga for some of the new mega-games doing the rounds, apparently he came up with the cracker: "Rounded down to the nearest million, there are no Amigas in the world!"

C64 Emuluation – again

I have just found out that a third C64 emulator is nearly finished, it will be shown around the major hardware companies soon. Called "Card128!" this item is aimed fairly and squarely at Amiga 500 owners who have no memory expansion whatsoever – it plugs under the machine (where an additional memory card is normally fitted).

Sporting a Z80 and a 6512 CPU, this machine emulates a C64 and a C128 with "as near as dammit" software compatibility. There is a port for the 1512 disk drive, the drive controller software is reportedly inside the Amiga.

Naturally this is pure gossip, but rumour has it that Card128! works like MS-DOS on the Amiga 2000, i.e. it has a window on the workbench that can act as a task under intuition! If this is the case, then transferring files from one machine to another should be a cinch.

Take your Pick

There were a few red faces at COMDEX recently as rumours were flying around that the XENIX operating system had been developed as an alternative operating system to AmigaDOS in case the Amiga's own one proved to be bug ridden! Mind you, I also heard that TRIPOS developed in the UK by the same team that did Sinclair's QL) was on the cards as well!

The last I heard of the XENIX rumour was when I heard a CBM man at the bar saying – "well if we have developed it, then it wouldn't work anyway, but if we haven't, then we sure as hell will soon!"

Latest news is that the A2024 colour monitor is on show in America; released to coincide with COMDEX, this little beastie has 1000 x 800 resolution. All of the pictures were pin sharp and there's no interlace resolution, CBM were pretty cagey about the price, and as for the case – YUK! I have seen better crafted monitors at the Atari stand – sorry guys, but it's an ugly S.O.B!

CBM Digitiser?

A new video digitiser called "NYIT Live!" was quietly being shown by a dealer (with a CBM badge!). I gather the plan is to get the Amiga audience "primed" by using products from Mimetics and Newtek, as soon as everybody is familiar with igitizing hardware and software, CBM will jump in with a licenced NTIY "Live!" card and clean up on the professional market. Only a pre-production model was on show, but it looks promising as it runs at 30 frames a second with 7 bits for each RGB colour, as opposed to the 3 or 4 you get with "ALIVE!"

Before you start thinking of replacing your 68000 inside the Amiga with a 68010, I got a call last week from a guy in Utah bitching about the fact tht none of the Psygnosis game will work with it fitted – I haven't been able to get any response from Psygnosis on this one yet, but then it's your fault for changing the Amiga's CPU isn't it?

This is a great little rumour. Did you know that the developers of the Amiga fought tooth and nail to have PC slots in the A2000 – yet the American reviewers slated it for this omission – isn't life tragic!

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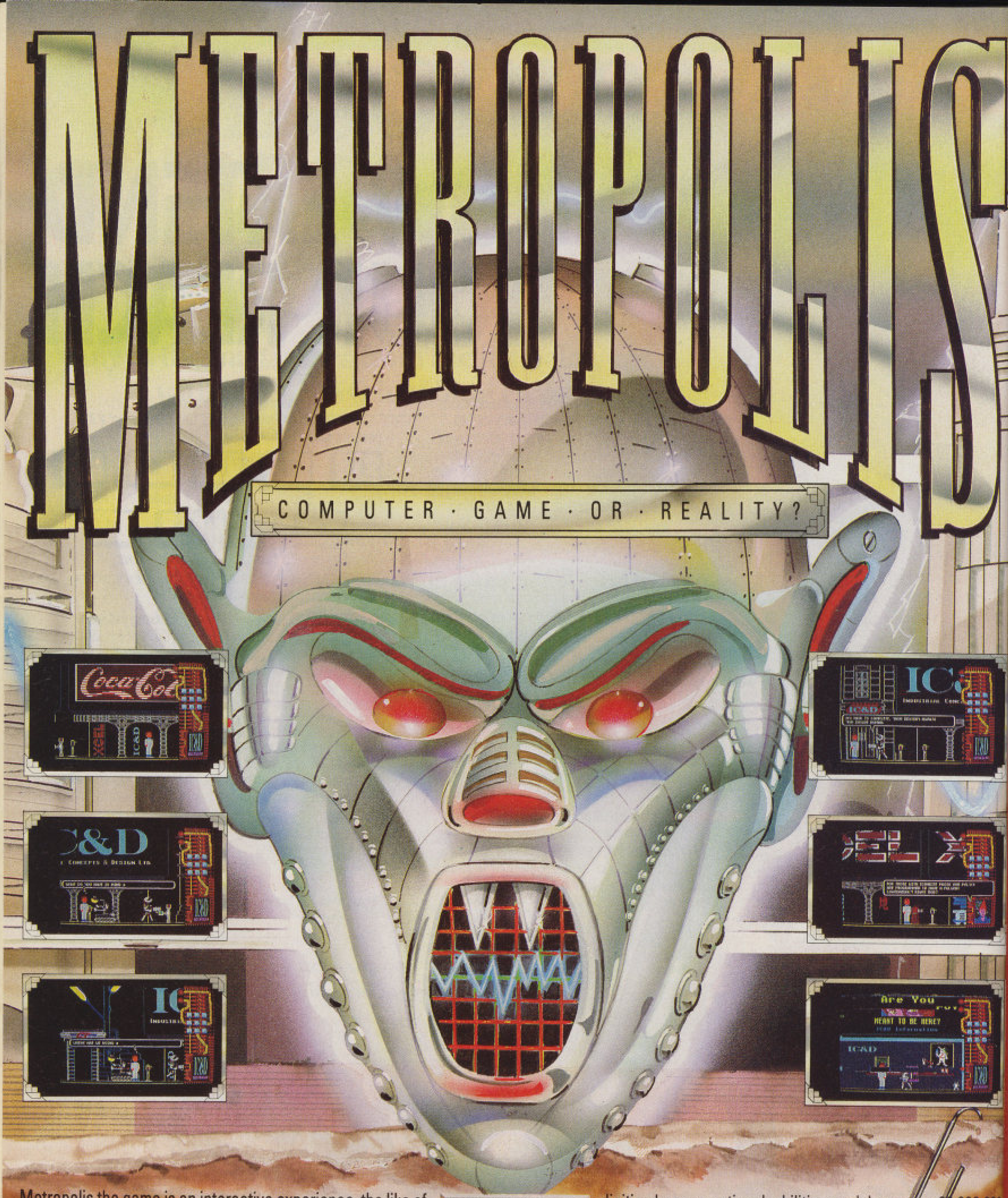


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answers to

Amiga On Line

Who? Anyone with an Amiga 500, 1000 or 2000, Kickstart 1.2 only.
When? From now on.
How? By dialling this number for information: 01 997 2591.

Compunet will tell you how to get onto a special bulletin board from which you can download the terminal software. This gets you onto *Compunet* for a look around. At this stage you can register your first subscription online.

How Much?

The subscription costs £19.99. Most regular users then pay for an 'off peak' rate on top which works out at about £18 per quarter. Otherwise London area users can get onto *Compunet* at 60p per hour. Outside London, with access via the ISTEL network, it costs £4 per hour.

Compunet already has a lively Amiga section formed by C64 upgraders with advice, criticism and debate, among other things, on shareware and public domain software. Nor are other computers excluded. Atari ST and PC owners will soon join and swell the ranks. There is even a lively Amiga versus Archimedes battle being waged as I write.

Window Magic

The terminal software, written by *Ariadne Software* – of 'Kickstart Guide' fame – is brilliant and fascinating to use. It operates in the full multitasking environment, with separate on-screen windows and pull down menus. This means that the Workbench, indeed any software, is available for use while Compunet is online. The prospect is in sight of downloading large files – as programs naturally expand to fill the available memory – in the background while you carry on doing something else!

Within the terminal this feature is used to maintain a directory display in one window while accessing pages of text or running demos in another, the picture window. A third window, the editor, can be opened. The editor can be used offline, the contents remaining intact in the editor while you go online to *Compunet*. While online, the contents of the picture window can be instantly copied into the editor. Any editing done can be accepted for use or rejected, in which case the editor window is restored to its original appearance.

But can an Amiga screen cope with a C64 display? Or are you confined to a special Amiga part of *Compunet*? As you might expect, the terminal software takes care of it, simulating the 64 character set for text based material. It is also possible to save 64 software to disk if you so wish. *Compunet* is a simple way of porting the data between machines. You might wish to convert a 64 BASIC program into Amiga Microsoft BASIC for instance or, less likely, vice versa. Amiga high resolution graphics will also be possible, the date being downloaded for display by the computer.

The items already on the menus when I viewed the development version of the software were LOGON, SETUP, DROP and QUIT and MAIL, CAT, EXECUTE, EXTEND, VOTE (a vital bit of people power on *Compunet)*, ACCOUNT, and LEAVE. Instead of scrolling through and highlighting commands, the Amiga user clicks with the mouse pointer on gadgets. The directory entries can be clicked on to move to a lower level of the directory tree or to activate a demo or set of text pages.

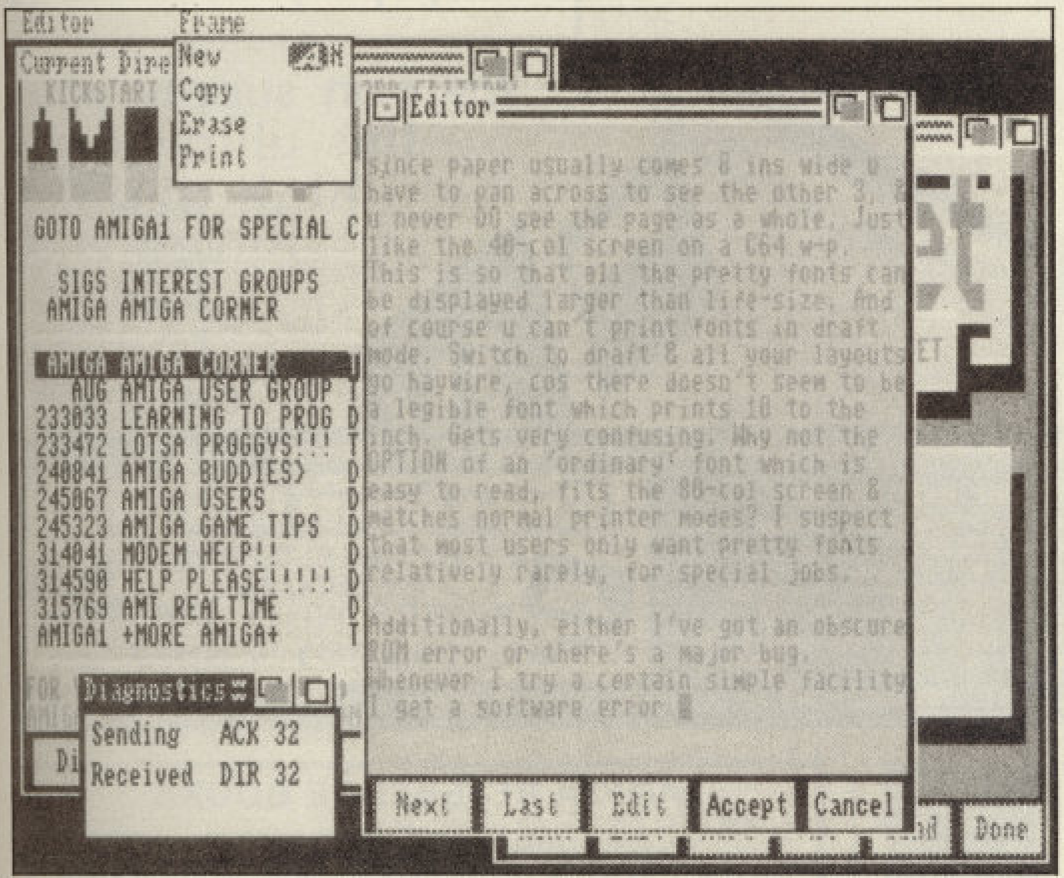
All the features familiar from the C64 are available to the Amiga user, including electronic mail.

New Features

I mentioned the problem of the sheer size of Amiga programs. *Compunet*

Amiga owners now have the opportunity to tap into the wealth of demos, utilities, debates and user feedback which is Compunet.

By A. Owen



currently operates at the standard 1200/75 on the Infotrax network. 1200 is acceptable from *Compunet* to the user, but say you want to send something to *Compunet* 75 baus is unrealistic. *Compunet* itself will undoubtedly support 1200/1200 one day when the majority of users have the appropriate modem, but in the meantime a separate 1200/1200 line will be made available for the London area. Amiga subscribers will also be able to send their disks to *Compunet* for them to upload onto the system. Compunet will be offering a modem deal to potential subscribers which will offer, at the least, an upgrade path to 1200/1200.

The terminal is currently 80 column but a 40 column version will probably be developed for those using an Amiga 500 in conjunction with a television. Of course the advantage of being on *Compunet* is that you can update your terminal software from the database when new features are added, software support business users pay £100s for.

Conclusions

Compunet itself is a very promising resource for the Amiga user. It is likely that the demo and software base will quickly benefit from upgraders, coders and importers of American material. There are already many demos available on disc. If the C64 material is anything to go by – there are well over 1,000 demos, previews, games, music, utilities and art – Amiga owners will have plenty to keep them busy. The editorial policy is to let authors put their own material onto *Compunet*, to monitor its success with other users and, as editor Jane Firbank puts it, to "immortalise the good stuff". Until something even better comes along.

The terminal software is of a very high standard with all the usual features such as resizeable windows, requestors – for a number to dial for instance – and pull downs. I was most impressed with the operation of the multitasking. Ariadne have fulfilled an ambitious design.

Help at Hand

Pop-up Utilities to make life easier.

By Anne Owen

Complicated as it is, the Amiga was bound to spawn utilities to harness the 'power' without the pain. I set out to test a few of the latest.

Zing! Keys

This is not just an add-on for owners of Zing!, a menu/control panel for AmigaDOS, by Meridian Software. Zing! Keys certainly works very well with Zing! but the provision of macro keys for any application, from DOS to Deluxe Paint 2, is potentially very useful for any Amiga user.

Macros are of course available within some software packages, e.g. WordPerfect. Most however contain no such facility. A macro is a series of key presses or commands held together in a form which can be called up by a single key press. For instance, while using the Scribble! wordprocessor, you can press a previously defined macro key to insert a series of 'dot' commands to format your document. Zing! Keys has a number of very useful built-in macros but any number can be defined by the user and assigned to Hot Keys. The Hot Keys is the key combination which calls up the macro function.

An amazing feature of Zing! keys is that you can record events as well as strings of text or key presses. There are a number of already defined Intuition macros which size and move windows with single key presses Mouse movements and clicks can also be programmed into macros.

Macros can be edited saved, loaded and merged. The definitions can be nested, delays inserted and variables introduced, e.g. prompting for a filename from the user, a string which is then entered into a command line.

Further use of this ability to 'record' is made with the HISTORY command. CLI commands are recorded and can be retrieved into a gadget window for editing and reuse. A more unusual use is the SECURITY-LOCK command which locks the keyboard until a password is entered – handy if you have to leave your desk and don't want anyone to tamper with your work.

There's more to Zing! Keys than first meets the eye. For anyone who likes to write their own batch files to configure their system then the programming element will be an enjoyable challenge. Zing! Keys can be used to customise an application for the novice user so that he just has to 'press buttons', or to setup an 'individual' environment. Separate hot key and macro definitions can be saved on any disk, ready for installation.

Meridian's manual is excellent and doesn't hesitate to repeat itself if necessary. There are some nice tutorial style sections.

Grabbit

This is a simple but useful utility. If dumping screens to your printer is important then Grabbit does a good clean job without crashing other software. Brilliantly presented on screen with good clear messages and help windows, Grabbit is polished software but is limited to the eponymous print screen function and 'Anytime' a colour palette utility. The utilities are installed by clicking on the Workbench icons and, once in place, are available by pressing a simple key combination.

Grabbit accesses the Preferences settings and sends the current screen to the printer. Anytime provides familiar slider controls which effect the colour combinations shown on screen. Knowing how much people like to individualise their colour schemes, I think this will prove a popular feature.

Gizmoz

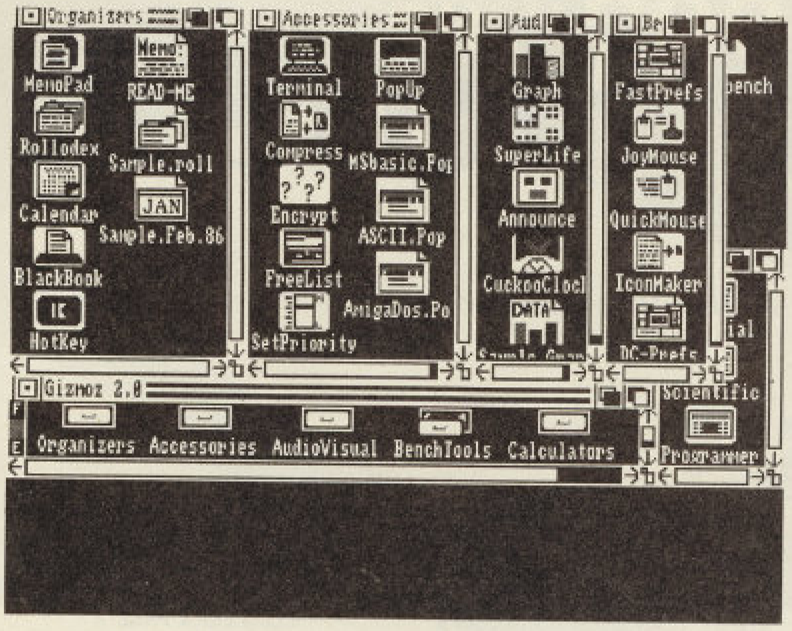
Gizmoz is a different animal. The single disk contains a vast array of programs and utilities, some more useful than others.

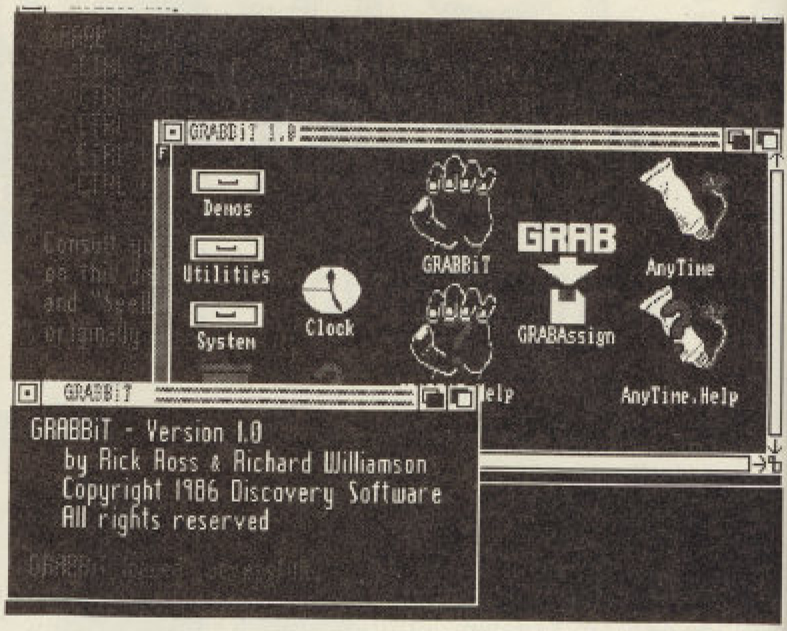
The first thing you do with Gizmoz is open up all the windows to see what you've got, clicking on icons indescriminately to see what's 'underneath'. Some fun things pop up, like the cuckoo clock – sure to replace the boring Workbench clock – but there are alot more rather static and uninteresting windows.

Not impressed? Well, quickly get into the excellent manual and you'll begin to realise that here you have a very workmanlike, even sophisticated, set of productivity tools. The key to the success of this variety of utilities/applications is the way they mesh with the Workbench, their way of working is instantly familiar. The sophistication of Memopad (text), calendar (dates/times) and Rollodex (card index) is internal to each application and shared by each. That is, text on screen can be cut out of one and pasted into another, a very handy integration of data which saves a lot of time. Printing from all three is dealt with by the Black Book tool, which sets up output of schedules, cards and labels.

The calendar can remind you of appointments and the Rollodex can dial a number from a telephone field, via a Hayes compatible modem. A bar, column or pie graph can be generated from a script written in Memopad and pasted in Gizmoz Graph. The resulting picture can be saved as IFF for incorporation into another graphics program. Colours can be chosen and pie segments exploded.

If you are a scientist, there's a





calculator which will work with exponetial notation, give you TAN, SIN, COS, square, square root and muchmore besides. If calculating annuity or compound interest is part of your job, there's a financial calculator – great for keeping track of that volatile share portfolio! And if you're a programmer, your calculator will work in binary, octal, decimal and hex; it will shift and rotate on 4, 8, 16, and 32 bit words and perform logical operations. Copy this one straight to your utilities disk. I opened it up while working on a program in another window.

Gizmoz also contians an array of utilities. FastPrefs lets you save Preference configurations which can be activated by clicking their icon. A library of configurations is very useful if, like me, you keep swapping printers. Joymouse sets up port two so that you can use a joystick like a mouse. Quickmouse adds an acceleration function to the mouse control software. Announce is an improvement over the Workbench speech demo. It translates English into phonemes too – handy if you're programming with TRANSLATE$. Running from CLI, Announce becomes a useful 'command' to take announcements from batchfiles.

Icon Maker turns making an icon into the simple matter of loading an IFF file (created, say, in Dpaint), sizing it and matching the Workbench colours. Next you choose the icon type, device, disk, drawer, etc, and its highlight (when you click on an icon it can be highlighted in three ways, complement, backfill or a new image entirely). Other status information is easily specified and the icon saved for use.

The Gizmoz Terminal will get you safely online to a text based bulletin board or service such as Telecom Gold. For file transfer there is Xmodem, Simple (Xmodem but with the original file length) and Amiga binary. There are six terminal emulations and full control over baud rates, parity and so on.

The Gizmoz Hotkey allow the user to define up to eight hot keys (key press combinations, e.g. CTRL-ALT-Z) and to assign a keyboard press (including HELP, TAB and RETURN) to the key. This definition is known as a macro.

You may find Gizmoz Popup very useful if you are new to the computer. It 'pops up' a card on the screen. Two cards describing Amiga DOS and Microsoft BASIC are available but you can prepare your own cards with MemoPad. There's a string search facility too.

Two, perhaps limited interest, utilities are compress and encrypt. Compress can be genuinely useful for file transfer – as long as the destination has decompress available. Also, in an office environment, encrypt may be a useful disincentive to anyone wanting to peek at your files!

Finally there's a game of Life – well-known and to be treated as a freebie on Gizmoz.

All I can say is 'how did they get it all on one disk?' Some of the utilities are available in different form in the public domain but you can judge their value for your own purposes. After a month's use, I'd now rate the Gizmoz productivity tools as essential items for the office, or home office, unless you have already invested in full versions of wordprocessor, database and spreadsheet.

Helpmates

It is interesting to note how little overlap there is between the many utilities available for the Amiga Those reviewed in this article are second string productivity tools. Gizmoz is highly recommended for those who don't like to leave Workbench. Grabbit too, is easy to use and does its (limited) job in an uncomplicated manner. Meridian's Zing! and Metacomco's Shell, reviewed in former *Your Amigas*, are more fundamental tools. Shell extends AmigaDOS and is my preference. Zing! puts an alternative and very powerful front end onto AmigaDOS as well as providing screen saves and dumps. There is now an improved manual and Zing! keys dovetails nicely with the earlier product.

Touchline:

Name: *Zing! Keys.* ***Price:*** *£25.00.* ***Machine:*** *Amiga.* ***Supplier:*** *Meridian Software:* ***Tel:*** *(713) 488 2144.* ***(USA)***
Originality: *8/10.* ***Useability:*** *8/10.* ***Documentation:*** *8/10.* ***Value:*** *8/10.*

Name: *Grabbit.* ***Price:*** *£21.99.* ***Machine:*** *Amiga.* ***Supplier:*** *Datel Electronics, Unit 8/9 Dewsbury Road, Fenton Industrial Estate, Stoke-on-Trent.* ***Tel:*** *0782 273815.*
Originality: *6/10.* ***Useability:*** *8/10.* ***Documentation:*** *8/10.* ***Value:*** *7/10.*

Name: *Gizmoz.* ***Price:*** *£49.95.* ***Machine:*** *Amiga.* ***Supplier:*** *Robtek Ltd.* ***Tel:*** *01-847 4457.*
Originality: *8/10.* ***Useability:*** *8/10.* ***Documentation:*** *9/10.* ***Value:*** *9/10.*



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Amiga Games

Saved up your pennies for a new Amiga game, but have to be selective – then read our comprehensive review pages

Test Drive

Have you ever wanted to drive a Porsche 911 Turbo, or a Ferrari Testarossa, or perhaps just have a quick spin in a little black Lotus Esprit Turbo? I have! I have wanted to drive one very fast down a motorway, safe in the knowledge that I could outrun any police car in the vicinity, or at least be warned in advance by a small radar device (now popular in the States).

So imagine what it's like – in your hand is a disk asking you to test drive one of the five most expensive and prestigious cars there are! Quite a challenge eh?

Test Drive is Accolade's latest offering since Hardball, and like Hardball, these guys really know how to design a loading screen; digitized speech, snappy music – hey, if the loading sequence is anything to go by, then the game looks set to be a stunner.

And what a stunner it is! You make a quick selection from the list of five cars (Porsche 911 Turbo, Ferrari Testarossa, Lamborghini Countach, Lotus Turbo Esprit and the Chevvy Corvette), each machine has its vital statistics on display, you select the one you most like (!) and away you go.

The basic idea of the game is to drive fast – very fast. Of course the police try to stop you, after all racing along at 120mph in a 55mph zone is not their idea of sanity. Initially the game is very simple, just don't go too heavy on the revs counter, just take your machine (mine's the Porsche!) up to 800 revs and drop the clutch, as the back tyres squeal, drop her into second, and so on, until you start to feel yourself lose control of the car and then you slow down.

At higher levels of the game, there are other cars driving in both directions, there are more police, a really sneaky hairpin bend, pits in the road and some rough dips and peaks forcing you to slow down a bit – but don't go too slow or you won't deserve to test drive any of these beautiful cars,



and the big letters GAME OVER will greet you.

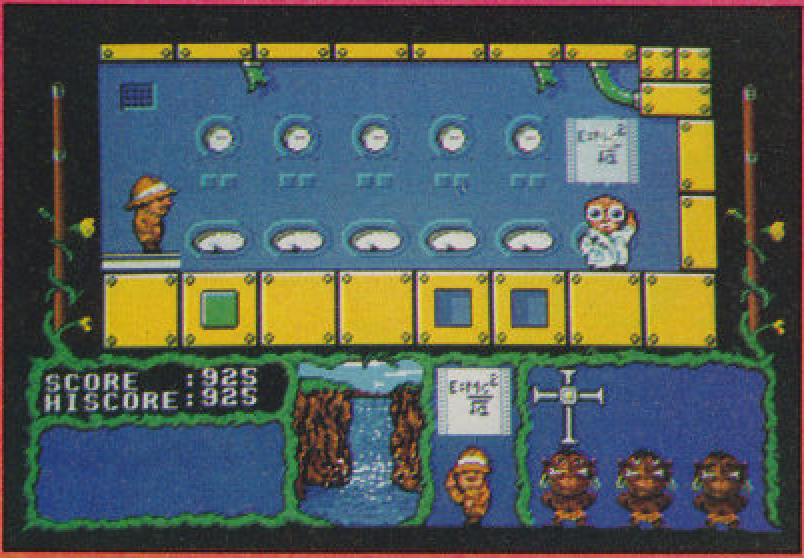
The simulation, for what I know of these marvellous cars, is quite accurate, the Testarossa clearly outperforms the Porsche 911, but the Porsche can be driven harder, the Testarossa has less road handling capability than, say, the Lotus Esprit, but the Esprit, like the Countache, is a little delicate when it comes to pushing the machine into overdrive.

A great game to load up when you don't feel like saving the universe, and a really great game if you happen to like fast cars. If you can, try this game out and see if you like it as people's taste in cars and car racing games are electric at best.

C.G.

Touchline:
Name: *Test Drive.* ***Supplier:*** *Accolade/Electronic Arts, Langley Business Centre, 11-49 Station Road, Langley, Nr. Slough, Berks SL3 7YN.* ***Tel:*** *0753 49442.* ***Machine:*** *Amiga 512K.* ***Price:*** *£25.95.* ***Originality:*** *5/10.* ***Playability:*** *7/10.* ***Graphics:*** *8/10.* ***Value:*** *7/10.*

Terramex



THIS IS POSSIBLY THE MOST INFURIATING GAME I HAVE EVER COME ACROSS IN MY LIFE. I have asked the Editor to leave this statement in capitals because I have played this game solidly all weekend with very little sleep, hardly any food. I have a pain in my neck and my eyes are slightly bloodshot – and I've enjoyed every minute of it.

Terramex is an amazing game, starting off as a pretty uninspiring graphic adventure, this game quickly moves on to become one of the best games I have played on the Amiga.

You play one of five national characters, who has been entrusted with the job of finding recluse/mad scientist Albert Eyestrain (and with glasses like his – you can see why) who predicted that the world will end by being smashed to smithereens by a huge meteriote.

The world laughed at Albert. He went off in a huff proclaiming that the world wasn't fit to be saved.

When the meteor was seen just 24 hours away from hitting the Earth, we realised what a silly bunch of people we had been, and therefore entrust one of our top agents, Herr Krusche, Wilbur Fortiscue Smythe, Wu Pong, Big John Caine or Henry Beaucoup – to find the Prof.

The adventure is whacky to say the least; there are lots of things to pick up (carried by your jungle bearers) and puzzles to solve. There are creatures in this landscape created by the Prof. such as rock snakes, Peterodactuls, and drops of acid rain – one touch from any of these and you lose a life.

The adventure is massive, with something new on just about every screen. The rope bridge, for instance had me thinking for ages until I came up with a suitably lateral way of crossing it.

When you do meet the Prof. the game doesn't end there, you will have to convince him the world needs saving and surrender many of the things you have found on the way. He is a bit of a cranky old fellow, saying things like "Make zis available?" between his calculations.

Terramex is likely to be a long lasting game because parts of the adventure are different when you play different characters. It will keep you interested, not only because of the detailed and colourful graphics, or because of the great music (somehow never becoming repetitive – now that's a first!) but because the character interacts with you more readily than in any other game: Try and jump off the edge of a cliff without the right item and he will shake his head, try again, and he will shrug his shoulders and jump.

This is a great game, infuriating and thought provoking with the right balance of whackiness and realism – I haven't seen a game like this on the Amiga yet, go out and buy it. Terramex is addictive and fun.

C.G.

Touchline:
Name: *Terramex.* ***Supplier:*** *Quicksilva/APS, Victory House, Leicester Place, London WC2H 7NB.* ***Tel:*** *01-439 0666.* ***Machine:*** *Amiga.* ***Price:*** *£19.95.*
Originality: *10/10.* ***Graphics:*** *9/10.* ***Playability:*** *10/10.* ***Value:*** *10/10.*

Grid Start



A bit of a different racing game this one; Anco have decided to stick to the more chunky approach – big sprites, brash colours, scrolling backgrounds and loud, but simple sound effects. You drive a six gear formula one racing car around six different racing tracks; Brands Hatch, Silverstone, Belgium, Mexico, Austria and Germany, each having their own distinctive backgrounds and track characteristics.

Grid Start is a pig of a game to get playing seriously though, you won't reach amateur status (let alone professional) for a few weeks of almost constant play. The secret of Grid Start, like real motor racing, is a question of learning the track off by heart, of knowing your racing car inside out, of knowing where and when to apply the break, change gear, even position yourself on the road for turning.

The game seems to be heavily modelled on Atari's Pole Position, or the later GX-1 (without the night time sequence). Dotted around the tracks are the ubiquitous advertising signs (a drink called "Enjoy" Anco's logo and Rush – the rock group) and the bales of straw, which, upon contact, make your car blow up.

Racing against other cars is very difficult, at first – it seems as if there are too many cars on the track, and if you're unlucky enough to crash into a car (or whatever), the chances of regaining your first place are very slim indeed. Most of the cars speed past you, and you are destined to 24th position – but that's life in the fast lane I suppose.

For all its chunkiness and basic (sometimes sparse) backgrounds, this is an excellent game. Anco have sensibly priced it – clearly making it one of the best value-for-money budget releases I have yet seen on the Amiga. C.G.

Touchline:
Name: *Grid Start.* ***Supplier:*** *Anco Software Ltd, 35 West Hill, Dartford, Kent DA1 2EL.* ***Tel:*** *0322 92513.* ***Machine:*** *Amiga.* ***Price:*** *£9.95.*
Originality: *5/10.* ***Playability:*** *8/10.* ***Graphics:*** *6/10.* ***Value:*** *7/10.*

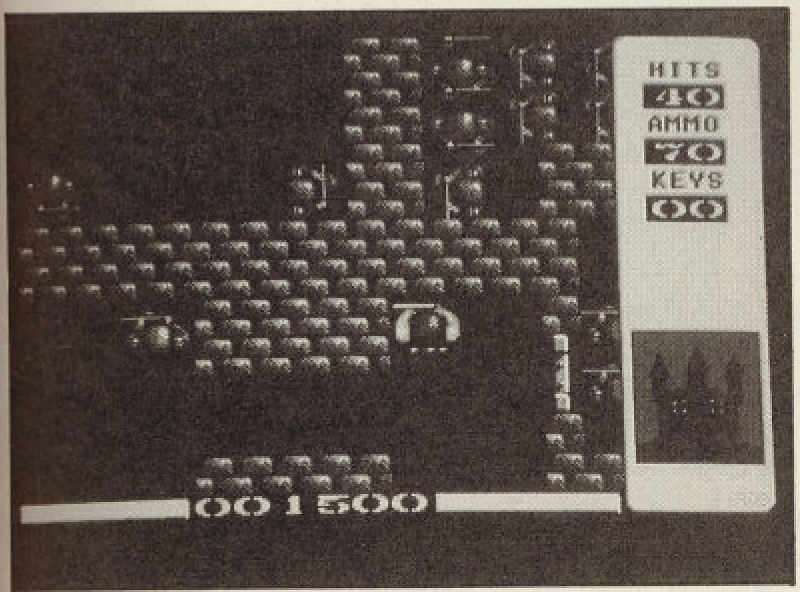
Eagles Nest

The Eagles Nest is a strategically positioned garrison fortress, believed to be a central command for an imminent enemy counter-offensive, which apparently poses a major threat to the continuation of "our" advance, and must therefore be eliminated before the final offensive can begin.

So the blurb goes on. This is basically a thinly veiled excuse to kill, kill and kill some more.

You play a character who can withstand 50 shots, and you can only carry 99 bullets on you, but the Eagles Nest has plenty of ammo dotted around the four floors with which to fill your automatic rifle and happily kill a few more Commies, Gooks – or whatever.

Not having seen the C64 or the CPC versions of this game released earlier, I must admit I wasn't overly impressed by the programming or the graphics on this one. It is a sort of World War II version of "Gauntlet", the basic premise being to explore as many rooms as possible, shoot anyone who gets in the way and eat food or take medicine as and when necessary.



The sound effects, although realistic, seem somewhat muted, even turning the Amiga's monitor volume control up full doesn't help matters – a shame as there could be plenty of scope for improvements (footsteps, ricochets, other bullets firing at you and the odd cry as an enemy bites the dust).

To make things easier, there is a supplied map of the ground floor; this is very useful should you want to start learning how to play the game.

You have to be pretty quick to play this game properly. If you don't watch your ammo, you could end up being cornered by a load of soldiers without any bullets with which to mow them down, or to shoot open a wooden door.

Eagles Nest is most certainly a playable game, a little crass at times, and the puzzles aren't really as demanding as with other games, but until Gauntlet is released for the Amiga, it will do. C.G.

Touchline:
Name: *Eagles Nest.* ***Supplier:*** *Pandora/Intercepter Micros/ Mercury House, Calleva Park Ind. Estate, Alder Maston, Berks.* ***Tel:*** *07356 3711.* ***Machine:*** *Amiga 512K.* ***Price:*** *£19.95* ***Originality:*** *6/10.* ***Playability:*** *6/10.* ***Graphics:*** *6/10.* ***Value:*** *6/10.*

The Hunt for Red October



The Red October is a new submarine design so quiet, with a revolutionary new drive system that makes it almost undetectable to the submarine's age old enemy – sonar.

You play one of the most senior Russian Submarine commanders, ordered to test the latest in Soviet death-mongering hardware. But (surprise, surprise), you decide to defect. Your officers are willing to risk their lives to join you while the enlisted crew members suspect nothing.

After killing the KGB-assigned political officer on board your ship (the one man who could blow your cover), you set off, under completely false orders to reach the West. Starting at Reykjanes Ridge, you have to slip out undetected by moving very slowly among the rock formations...

Thus starts the latest in simulations and "strategic" games programmed by Oxford Digital Enterprises, and with the Amiga, they really have had a ball game, using full colour graphics, (a lot of which is digitised), some sparse, but effective sound effects, and mouse control throughout.

Red October isn't a particularly action packed game. Being a more sedate version of "cat and mouse", you have to avoid detection by all sides until you reach a safe port of call (it's either that, or you crash off some country's coastline).

If you are detected by the Americans, they will help you throughout. Russia will, of course, want to blow you out of the water for defecting with their submarine! The English are there also, but their actions are not at clearly defined as the US or USSR ships, although they tend to be a lot faster at manoeuvering.

The game is controlled completely by the mouse, pointing to each respective icon for each member of the crew. The main control panel basically informs you of the ship's direction, the depth and speed of the ship. You can use the compass to change course.

The sonar officer represents the "eyes and ears" of the submarine, while underwater. This has its disadvantages, such as requiring a visual sighting before taking any action (sonar traces are highly subjective) and using sonar can also leave vulnerable blind spots which can be exploited by hostile attack submarines.

There are plenty of other options – all of which have something to do with the running of Red October, your job is to plan ahead as far as you can, take defensive action (at first) but strategically plan offensive tactics should you find yourself in a tight spot.

Red October is a good game for thinkers. There is plenty of visual information, and the supplied maps and notes are essential reading. Another nice touch is the newspaper

headline at each end of the game, you will get one should you successfully dock Red October in the West, but not all countries are willing to accept a state of the art submarine (with a nuclear capability) and they will do their best to fend you off.

Lots of features, lots of options and lots of colourful graphics, all you need is lots of time. C.G.

Touchline:
Name: *The Hunt for Red October.* ***Supplier:*** *Argus Press Software, Victory House, Leicester Place, London, WC2A 7NB.* ***Tel:*** *01-439 0666.* ***Machine:*** *Amiga.* ***Price:*** *£14.95.*
Originality: *9/10.* ***Graphics:*** *8/10.* ***Playability:*** *7/10.* ***Value:*** *7/10.*

Western Games

Now, this is a novelty! If you want to learn how the wild west was really won, then this game is for you. No shooting Injuns here, just good wholesome family entertainment such as spitting, shooting beer glasses (using the village idiots as target bearers), eating as much food as you can (but you have to keep it all down) and arm wrestling.

The games on this double disk package are bright, vibrant and very, very silly. Instead of going for realism the programmers of this little gem have decided to make it look like a cartoon or a comic strip and their attention to detail has made what is one of the most graphically inviting games around for any machine on the market.

This is, I think the first wholly German program I have seen for the Amiga, released by a software house called Magic Bytes it is an original game, a bit like the "Olympics" games currently available for the Amiga, but on a more down to earth level.

You will need a joystick to play this one, and it will get some pretty heavy bashing, as it is one of those games that requires fast pushing and pulling on the stick in order to control your character on the screen.

The first game you play is the baccy spitting competition (like I said, good clean wholesome stuff). You chew as much baccy as you can without swallowing, you select the force at which you want to chew, select the angle of the spit and simply gob away!

Likewise, the beer shooting competition is similar, you first draw your gun, and roughly aim the cross over your target (ranging from glasses, bottles, kegs and so on...) you select the right moment to fire and then shoot.



All of the competitions are very difficult to play to begin with, but after a while, you pick up on the rhythm of the game, and after that, it is plain sailing!

A very nice series of games to look at – and great fun to play, especially with a second player as your opponent. Definitely one to bring out at a party! C.G.

Touchline:
Name: *Western Games.* ***Supplier:*** *Ariolasoft, 9 Disraeli Road, Putney, London SW15 2DR.* ***Tel:*** *01-785 4285.* ***Machine:*** *Amiga.* ***Price:*** *£19.95.*
Originality: *7/10.* ***Graphics:*** *8/10.* ***Playability:*** *7/10.* ***Value:*** *7/10.*

Q Ball



English Software have recently converted and upgraded the Atari ST version of this game for the Amiga. It is a sort of 3D Zero gravity game of snooker with mouse control and full colour graphics.

The problem is that while Q Ball is very easy to learn, the game is nigh-on-impossible to play and control properly.

I have tried this game out with many different friends (most of whom already have STs of Amigas) and none of them could control the ball properly – even after a month's full playing. So in the end we satisfied ourselves with randomly aiming the ball and hitting the cue as hard as we can (more logical attempts proving fruitless).

The graphics looks nice, the sound effects are very nice and the music is good (when it lasts) but other than that, Q Ball is best left to lesser machines such as the Atari ST – it is not worth playing because there isn't a game here. C.G.

Touchline:
Name: *Q Ball.* ***Supplier:*** *English Software, North Parade, Parsonage Gardens, Manchester M60 1BX.* ***Tel:*** *061-835 1358.* ***Machine:*** *Amiga.* ***Price:*** *£19.95.*
Originality: *9/10.* ***Graphics:*** *9/10.* ***Playability:*** *1/10.* ***Value:*** *2/10.*

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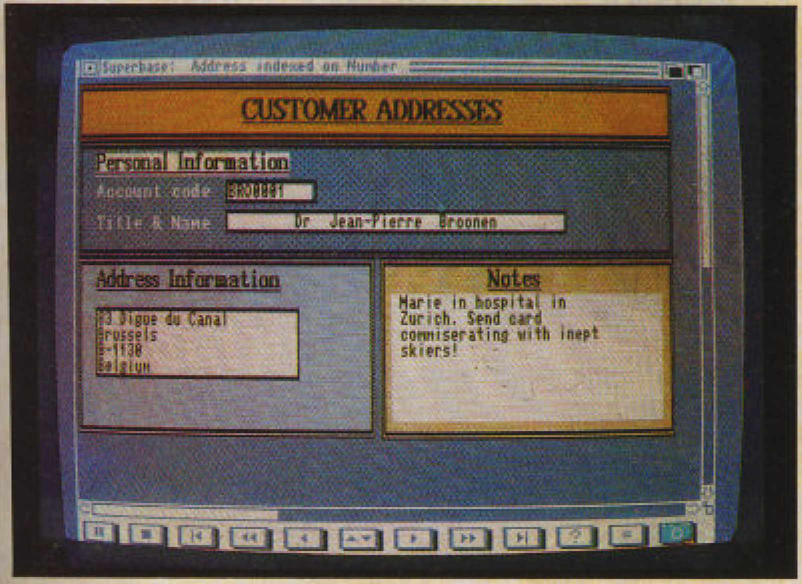
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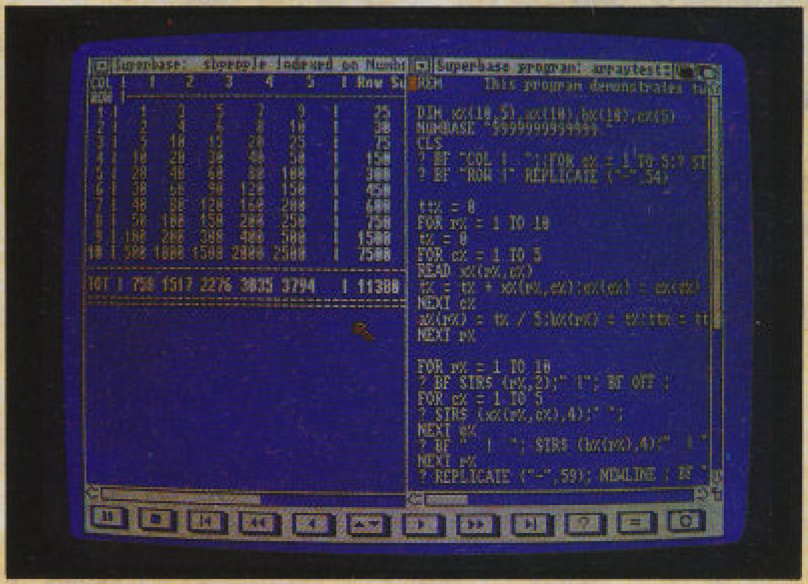
VISA

Superbase Professional

Superbase fulfills its promise with the addition of a forms designer and programming language

By Anne Owen





Superbase is instantly recogniseable by the VCR style controls (an idea now 'borrowed' by other database programmers) has been evolving over at Precision in Surrey, into Superbase Professional.

The new software tidies up some of the old and features new elements such as a text and forms editor. The most important addition however is that of a programming language for Superbase. The designers have not come up with some esoteric database language for us to learn but have sensibly made the familiar structures and keywords of Basic available for Superbase programming.

It's worth reminding ourselves of some of the unique features of Superbase, all of which are now programmable. A database file can have an external file linked to it which can contain text, screen pictures or music data. The pictures can form a slideshow or can be dumped to a printer; the music can be played back at a tempo programmed from Superbase. The equivalent program keywords are SHOW and SCRDUMP.

Superbase supports the Amiga's speech facilities and the program language provides the keywords SAY USING followed by the parameters for pitch, inflexion etc.

Superbase files can cross reference with other files. For instance a holiday record file might have fields common to a firm's personnel file with holiday entitlements in it. In this way updating on the personnel file also effects the variables in the holiday file itself. Some relevant program keywords are CREATE and INDEX.

Superbase strives to allow English language style expressions where possible, e.g. the relative concepts of time TODAY and NOW and LIKE string matching function, all available via the programming language.

Superbase Basic

When the program option is selected, an edit window opens, just like Amiga Microsoft Basic. A program menu is available with Run, New, Edit, Open,

Close, Save, Print and Remove options. You can move into the database window at any time, or open a command line window for directly typing in program commands.

The program editor has many of the features of the text editor including delete word, delete to and of line, clear line, split line, join line, insert mode on/off and undo, making program writing a pleasant task.

Familiar (to Basic users) keywords are ABS, ASC, ATN, CHR$, COS, DATA, DIM, INT, LEN, SQR, CLS, INSTR$, LEFT$, LIST, LOG, MID$, MOD, NEW, READ, REM, RESTORE, RIGHT$, RND, RUN (from memory or disk), SGN, SIN, SQR, STR$, TAN and VAL.

As with many keywords, LOAD and SAVE can be used with parameters to give them wider use than normal in Basic. They can deal with a tokenised program, with text, with a query file, an update file or function key definitions and can add one file to another.

CHAIN loads a new program but retains variable information. CLEAR and ERASE clear variables while SET interprets variable settings and commands from a disk file. ERRNO, ERR$, ON ERROR and RESUME help with error tracing and FREE gives a memory free figure.

The main control structures are FOR TO NEXT, IF THEN ELSE and WHILE WEND. There are no line numbers but you can GOTO or GOSUB to a label and (of course) RETURN to the main flow of the program. ON GOTO and ON GOSUB are also available.

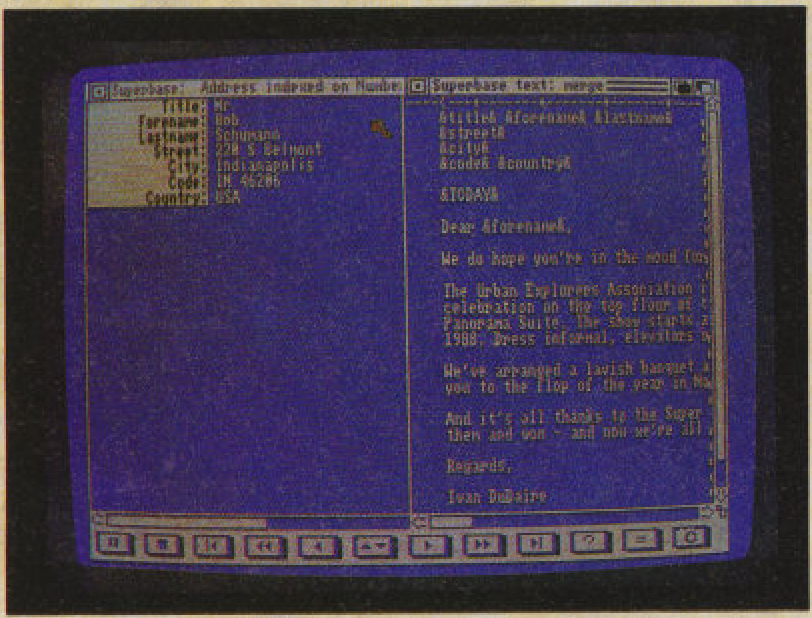
DOS like commands COPY, DELETE, DIRECTORY, RENAME and SETBUFFERS are available from within a program. CALL calls up any DOS command from disk for execution before returning control to the program. DISKSPACE is also useful when files are filling up fast. EOF detects the end of a Superbase file.

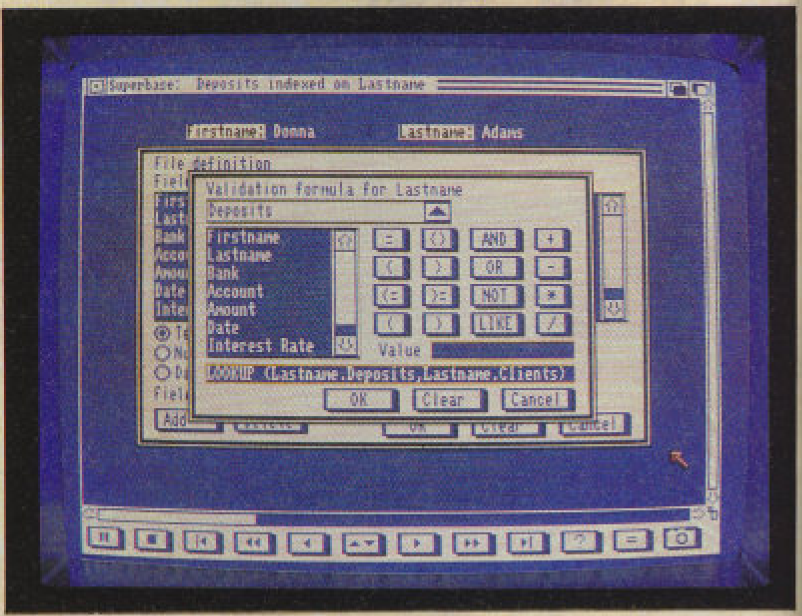
Superbase deals comprehensively with time, indeed there seems to be a strange preponderence of time based keywords: DATE$, DAY, DAYS, HRS, MINS, DATEBASE, TIME$, THOUSECS, TIMEVAL, TODAY, NOW, YEAR, MONTH, MONTH$, SECS. All are available to define the date and time format and to express or assign the required moment, down to milliseconds!

String handling is a vital part of database work, carried out in Superbase by the following keyword commands: FCASE$, LCASE$, LTRIM$, UCASE$, TRIM$, and SPCAE$. Number precision can be set with FIX.

The cursor position is read by COL and ROW and is assigned by LOCATE and HOME. NEWLINE moves to the next line, REPLICATE reproduces a character a specified number of times and SET PAGING controls the page scrolling while WAIT does just that. Bold, underline, and italic text can be easily turned on and off.

PRINT selects the printer as the output device. PCOL and PROW detect the printhead position and EJECT can be used to ensure sensible page breaks for printed output.





Tale of Two Users

I put myself initially in the position of a user setting up forms for presentation on screen and paper, including mail merging and reports and secondly in the position of a programmer/consultant creating an easy to use system which inexperienced operators could use efficiently.

Forms

For the former the forms editor is the first port of call. Forms have the advantage that they present information on screen or on paper in a manner designed by the Superbase user. Specified information from a combination of files can be displayed clearly and attractively.

Forms are designed page by page, a printer page, not a screen full, and each form consists of three pages. Pages can be saved and reloaded, and their positions within the forms swapped about in memory.

The sort of thing you might do is to print a two page form to an ordinary dot matrix printer a page at a time and then match them up for an A3 photocopy. If you can sheet feed your printer then an A4 form design can be printed once, photocopied many times and the resulting forms put through the printer to have individual details filled in.

Calculated fields, which change dynamically, can be added to the form. They are attached only to the form, not to the file. The report functions SUM, SD, MEAN, MAX, MIN and VAR are available.

Any of the files supplying information to the forms can be made the master file and new selection criteria applied to the records.

The form can appear in 4, 8 or 16 colours and the design itself is carried out with the aid of the following 'objects': areas (solid and patterned fills), boxes, lines, images (loaded from

other paint programs), text and fields (supplied by the data files). The 'object' is placed on the form in the desired position and can be moved, copied, edited or deleted. An invisible grid can be turned on to help alignment of objects and a 'reduced' preview of the complete form can be displayed. Field objects can have justification adjusted, can be set as 'read only' and can be automatically given a border and/or the field name before the data.

Printing of the form can be in text or graphics modes. Each object can have a value assigned to it which indicates whether it is to appear on a printout or not. Some design features (especially colours) may look excellent on screen but confusing on paper.

Function Keys and Automatic Reports

For performing repetitive but limited actions on the data the user needn't go as far as writing a program. Function keys can be used very effectively. Commands can be assigned to the function keys and activated with a single key press. For instance loading a letter into the text editor and extracting a couple of names and address fields for merging and printing. KEY displays all the current definitions, which can be loaded and saved as required. Programming function keys with often used strings also helps with data entry. The text editor has a complete set of menus of its own and is capable of 64K documents. A format ruler can be placed at any point in the text. There is help on key presses and the mailmerge simply involves inserting field names in the text between the & character (Wordstar style).

Another boon to this user is the automatic generation of reports without the need for programming. The reports are designed on screen with the forms editor. On saving, the editor automatically creates a report file and an associated Superbase program file which will reproduce the report on screen or printer, including title page and totals page if required.

Programming

Because the command language matches closely the menu options in Superbase, any regular user can turn his hand to programming and quickly get a feel for the actions which will result from a program. The professional programmer can go a step further to automate data processing or design an interface suitable for a particular Superbase application.

It is possible to create files from scratch within a program via CREATE, ADD, MAKE and INDEX. There are also the corresponding QUIT, REMOVE FILE and REMOVE INDEX. Files can be saved with PROTECT and, for further security, a password added with PASSWORD.

Record creation involves the use of BLANK, ENTER and STORE keywords. Field values can come from the user with EDIT (whole record) or ASK (specific input) or values assigned directly from DATA in the program or INPUT from disk files. POINTER can be used to control the pointer in an ASCII file when extracting data.

REQUEST is a vital command which brings up one of the variety of existing Superbase dialogue boxes. You can manipulate menus with MENU ON and CLEAR (menu). Presentation as record, table or form can be set and records selected with SELECT – CURRENT, DUPLICATE, FIRST, KEY (with string parameter), LAST, NEXT, PREVIOUS and REMOVE. A path can be set to a validation file (which checks data entry) and suitable error message issued. Data entry can also be forced if necessary.

WHERE sets a filter on the fields selected (by SELECT) for report output or for other query applications, such as sorting, merging files or simply retrieving data. Sorting is carried out by SELECTing the fields upon which to sort and ORDERing them, either ASCENDING or DESCENDING.

Forms, reports and mail merging can all be handled from within a program. Both function key definitions and programs can be loaded automatically by creating a program file called START, which Superbase will load and execute on startup, allowing a 'turnkey' system to be easily implemented.

Conclusions

A journalist colleague recently remarked that the potential of the Amiga hadn't been realised. True, but Superbase is one of a new generation of software now realising it. The creative (graphics, page design, fonts, speech and music) is combined with the practical power of a relational database. The one limitation you are probably already aware of is your printer. The appearance of fonts on screen is often much better than on a graphics dump. The Amiga does not have special font libraries to accurately reproduce these, even on a laser printer.

The designers of Superbase haven't made any assumptions about what the business user will want from the database. After all, these days the business computer is more than likely used in the engineering of science departments as much as in administration. A scientist will appreciate the precision of numbers and the accurate dates, even including changes to the calendar in 1752.

Superbase, like all good software, creates its own working environment. The new features of Superbase professional allow the powerful features to be extended or for the environment to be restricted for a particular category of use or user.

The fast Amiga interface shines through but I must mention, as I have with all the disk based software, that the performance of the Amiga floppy disk drives inevitably slows down the movement between some operations. Users who have Superbase up and running daily would benefit, indeed profit, from a hard disk (they start from £694 from Precision).

When Superbase was demonstrated to me on a 512K A1000, the program very quickly ran into memory problems. These were instantly cured by the fitting of a Promiga megaboard 2 from Progressive Peripherals. I suggest, if you are working with 512K, that you discuss this with Precision before purchase.

The documentation is of a high standard, one manual for Superbase, another for the new Superbase professional features. Although these are general purpose manuals, Amiga users can easily avoid the material about Superbase on Atari and MSDOS, though it is obvious that many Amiga features such as speech and external music files are missing from the inferior versions!

Upgrade prices will be available and registered users wil be mailed by Precision.

Touchline:
Precision Software, 6 Park Terrace, Worcester Park, Surrey, KT4 7JZ. ***Tel:*** *01-330 7166.*

Contributions

So you own a Commodore? So you've written some programs? So why haven't you sent them to us?

Your Commodore is always on the look out for new programs, hints and tips, articles and even regular series. In fact if you have something that you think could be of use to other Commodore owners we want to hear about it.

So if you have got something which you think we may be interested in. How do you go about submitting it to us?

Below you will find a list of guidelines that will help us to deal with any item that you send in to us. We don't expect everybody to be the next William Shakespeare but if you do follow these simple rules then it will make our job a lot easier.

1) If possible all material sent to the magazine should be typed or printed out on a computer printer.

2) All text should be double spaced i.e. there should be a blank line between each line of text. You should also leave a margin of about 10 characters around the text.

3) On the very first page you should put the following:
Name of the article
Machine that it is for
Any extras required - disk, printer etc.
Your name
Your address
Your telephone number

4) The top of every page should have the following information on it:
Abbreviation of the article title
Your name
The page number

For example, suppose you had submitted an article on C64 interrupts. You should put something like the following at the head of the page:

Interrupts/J.Smith/1

5) Please make sure that you do not make any additional marks on your text especially underlining.

6) Try and write in clear concise English, it does not have to be a work of literature but it must be comprehensible.

7) On the bottom of each page you should put the word MORE if there are more pages to the article or ENDS if it is the last page.

8) If possible, enclose a listing of all programs.

9) Under no circumstances use a staple to hold the pages together. Use a paperclip instead.

10) Programs should be included on either disk or tape. Make sure that you SAVE two copies of every program so that we have a better chance of loading them if problems occur.

11) Programs under 10 lines can be included in the text. If your program is longer than this you must enclose a disk or cassette.

12) If your article needs any artwork then supply clear examples of what is needed. We don't expect you to be an artist but we do need to see what is required.

13) Photographs, if necessary, must be either black and white prints or colour slides. We can take shots ourselves so don't worry about this too much.

14) Submissions of any length are welcome. If you have a five line routine that you think may be of use to someone else we welcome it just as much as a full blown six part series.

15) Payment varies quite a lot and depends on quite a number of factors, such as complexity of program, presentation of program, number of magazine pages it takes up etc. Payment is generally between £10.00 and £800.00.

16) All payments are made in the month that the magazine containing your article has appeared in print.

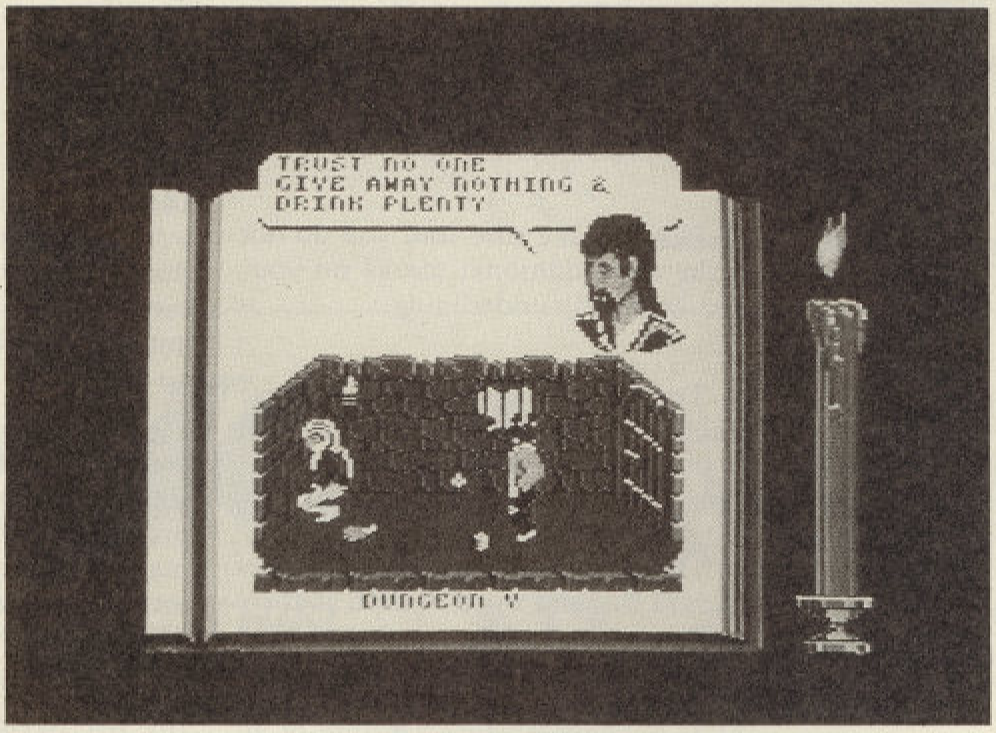
17) If we do find your submission suitable for inclusion in the magazine we will write to you giving the terms of publication, the rate of payment and an agreement form. Prompt return of this form will allow us to use your program as soon as possible.

18) If you want the program returning to you, should we find it unsuitable for publication, then you should enclose a stamped self addressed envelope.

19) The last and most important point to make is 'get writing', we are waiting for your articles.

I.Q.

Strain your brain with the recent intellectual releases



Knightmare

Welcome watchers of illusion, to the castle of confusion... If you recognise these opening words then you're already one of the dedicated followers of ITV's cult roleplaying TV game Knightmare, in which teams of advisors guide a knight, blinded by a full facial helmet, around a computer generated graphic dungeon. The graphics in the TV program were created by two Supernova computers which are slightly more powerful than your average C64 so this is obviously going to be a cut down version from Activision.

You play the knight who must find his way out of the Knightmare by solving his problems and overcoming the monsters and go to the second wilderness section. To help you in your quest you can seek advice from two Oracles. However, one is good and the other is evil so you should listen to both sets of advice but follow none to find the successful middle path. You will also hear from Treguard, the Dungeonmaster whenever you waste time or attempt pointless actions or anything else that annoys him.

Your quest is told in 3D graphics which is displayed on the turning pages of a book alongside a burning candle which represents your lifeforce. As monsters hit you, and poison and traps take their toll, the level of the candle will plummet to end your game.

You control the Knight's movements with a joystick and his actions with adventure style commands selected from menus or by pressing the first letter of the command, object, person or sell. This may seem an efficient method – however it can cause you problems as it takes a long time to throw a rock while a ghost and a demon chomp at your heels.

Unfortunately, the game also suffers from a few annoying bugs such as if you throw a rock in one room and then enter the other, the same rock comes flying across to meet you! To add to this the graphics are crude and the

action is far from the combination of traditional adventuring and arcade action promised on the packaging.

There is no way a C64 can mimic the efforts of two Supernovas and live actors but surely it can come closer than this. Perhaps the approach used in Dragon's Lair and Escape from Singe's Castle would have been better. Disappointing I'm afraid. **T.H.**

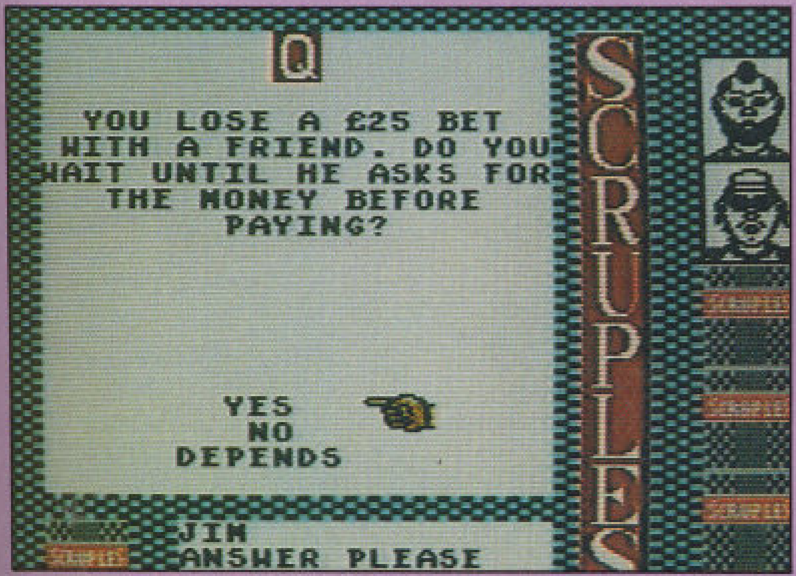
Touchline:
Title: *Knightmare.* ***Supplier:*** *Activision, 23 Pond Street, Hampstead, London NW3.* ***Tel:*** *01-431 1101.*
Machine: *C64.* ***Price:*** *£9.99 (Ca) £14.99 (Disk).*
Originality: *6/10.* ***Playability:*** *4/10.* ***Graphics:*** *5/10.* ***Value:*** *5/10.*

Scruples

This is a computer version of the best-selling board game which is best described as a sort of thinking man's Trivial Pursuit.

The game poses a series of moral dilemmas to each player in turn. It is up to you whether you decide to answer truthfully or bluff your way out of things but you are always likely to be challenged in which case you will have to justify your answer. The other players will then vote as to whether they believe you or the challenger.

A typical question would be, "If you saw your boss coming out of a cinema that showed exclusively blue movies, would you tell your colleagues at work?" Personally, I would only bother if I recognised him appearing in one of the blue movies!



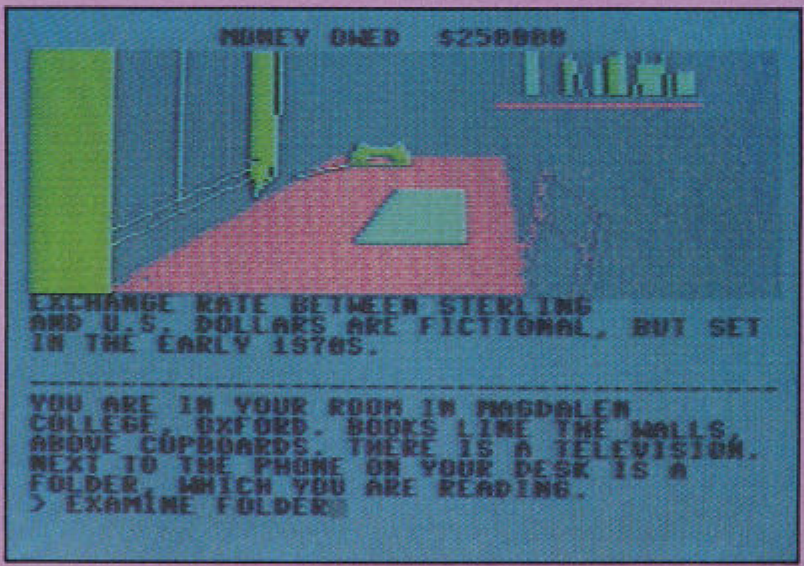
Between three and ten players, either human or computer, can take part in a game. Setting up the game is somewhat tedious as you must select from sixty-four different faces for each computer player and define personality traits for the humans. This involves defining on a bar chart how you see yourself for each of twelve different characteristics. These range from personal integrity via greed to family relationships. The computer then adjusts your inputs slightly and presents you with a new graph at the end of the game according to how you answered the questions.

The game itself depends on getting rid of your dilemma cards before anyone else does. You have an answer card (yes, no or depends) which is kept secret from the other players and the trick is to ask questions which will force players to give the same answer as you have on your card.

The problem with the game is that to get the best out of it, you need to be watching the other players and judging their reactions. Against computer opponents, this is obviously impossible. Again, with human opponents, making them look away as you examine your answer card destroys the atmosphere of the game. The conversion of the game is excellent, no complaints there. I just think that this is the wrong sort of game to be converted in the first place. Whereas it works well with a group of you sitting round a table, it fails miserably when you all move to the small screen. **G.R.H.**

Touchline:
Title: *A Question of Scruples.* ***Supplier:*** *Leisure Genius/Virgin, 2-4 Vernon Yard, Portobello Road, London W11 2DX.* ***Tel:*** *01-727 8070.* ***Machine:*** *C64.* ***Price:*** *£12.95 (Ca) £14.95 (Disk).*
Originality: *8/10.* ***Graphics:*** *6/10.* ***Playability:*** *3/10.* ***Value:*** *3/10.*

Not a Penny More, Not a Penny Less



It was surely only a matter of time before Jeffrey Archer found his way somewhere into the computer world. After all, his list of appearances in recent years has been considerable – television, books, the stage, political rallies and the High Court. Domark have affected the link up and produced a games based on Archer's first book, Not a Penny More, Not a Penny Less.

The book, like most first novels tends to be semi-autobiographical. Four totally unconnected people are persuaded to sink their life savings into shares in an oil company. There is the promise of enormous profits but the deal turns out to be one large con trick and the punters lose one million dollars between them (early 1970s prices).

You play one of the four, Stephen Bradley, and it is up to you to contact the other three and persuade them that you ought to try and get back all the money that you were swindled out of. Hence the title of the game.

That is the gist of the story and a very good one it is too for whether you like Jeffrey Archer or not, he does tell an excellent tale even if his literary powers do not feature among the world's greatest.

The games itself is a different matter and I am afraid that it takes the art of adventuring back into the dark ages. The list of problems and bugs is phenomenal and I can do no more than mention some of the ones that occur at the start of the game.

The parser is pathetic. Even by the standards of games written five years ago, it is dire. There is no inventory command so that if you pick something up, there is no way you can find out what you are holding at a later stage of the game. Directions have to be typed out in full, e.g. 'go north east' rather than just 'NE'. Not that you can move anywhere anyway. At least not until you have solved certain puzzles. The game is entirely linear in construction so that everything must be done in an exact order. Get it wrong and it is effectively game over although you are not told that at the time.

Although many items are described in the location descriptions, trying to examine them further is by and large a waste of time. In some cases they disappear totally. For example, you start off in your room in college (you are a university lecturer). In the room is a bookcase and a cupboard. Or at least there are until a policeman arrives and catches you with an incriminating dossier open. Then they disappear. If however you manage to close the dossier before the policeman arrives, after he as gone, re-examination reveals a vital phone number that you managed to miss first time around.

Still the bugs haven't finished. Phoning Scotland Yard puts you through to your stockbroker (perhaps this is an intentional dig at BT). Examining the top names in the dossier gives you a description of your rooms again. I managed to go and see this first character, a doctor, on three occasions within one game; each time following exactly the same sequence of events because no flag had been set to instruct the program only to allow things happening once.

There are graphics but they are of the line variety complete with a fill routine that takes ages to complete. The program also boasts an impressive speech routine but there is so much hiss that it sounds like a badly tuned radio station. Pronunciation isn't all that it might be either. Magdalene College is pronounced a mag-da-lin instead of maudlin.

Perceptive readers will notice that I was not too impressed with this game. In fact, I would go so far as to say that this is the worst full priced adventure I have played for several years. The package includes a copy of the book which is necessary to find out what you are supposed to be doing. My advice is to go and buy the book and ignore the game, especially at just under fifteen pounds for a cassette version.

G.R.H.

Touchline:
Title: *Not a Penny More, Not a Penny Less.* ***Supplier:*** *Domark, Domark House, 22 Hartfield Road, Wimbledon, London SW19 3TA.* ***Tel:*** *01-947 5622.* ***Machine:*** *C64.* ***Price:*** *£14.95 (Ca) £16.95 (Disk).*

Eye

Another computer version of a board game and one that is almost impossible to describe if you haven't seen it before.

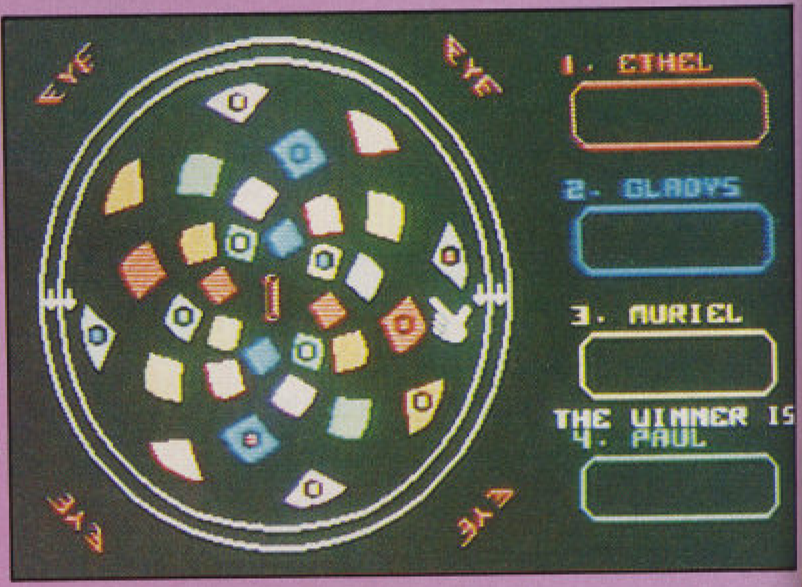
The playing area is a circle with four squares of eight different colours showing at any one time. The position of these squares is altered by rotating two spirals within the circle. The object of the game is to place the requisite number of your own pieces on your own colour before your opponents manage the same feat. How many pieces you need is determined by the number of players.

You have a number of moves determined by the highest number of pieces you have on any one colour. A move can consist of sliding one of your own pieces to an adjacent square or twisting one of the two spirals to change the pattern of the colours either with the object of hindering one of your opponents or helping yourself. If that wasn't complicated enough, you can also control netural colours and at the beginning of each turn, you can move any of your opponent's pieces that happen to be lying on a colour you control.

Although it all sounds very complicated, you soon get the hang of what's going on and the game becomes quite addictive. One advantage of the computer version is that there are several game variations that are not possible in the board game but against that, one of the most enjoyable parts of the board game is moving the spiral and watching the colours change. In the computer version, this effect is lost as the screen blanks out and redraws with the new pattern.

Eye is the sort of board game that converts well to the computer and fans of strategy games like this who are in constant need of someone else to play against will not be disappointed. Two minor quibbles. The printed instructions are somewhat sparse and could usefully have been expanded and also there is a silly grammatical error when you are setting up the game (whose instead of who's). I know it's trivial but it does have the effect of making the finished product look unprofessional.

G.R.H.



Touchline:
Title: *Eye.* ***Supplier:*** *Endurance Games, Prism Leisure Corporation, Unit 1, Baird Road, Enfield, Middx EN1 1SJ.* ***Tel:*** *01-804 8100.* ***Machine:*** *C64.* ***Price:*** *£12.95.*
Originality: *9/10.* ***Graphics:*** *7/10.* ***Playability:*** *7/10.* ***Value:*** *7/10.*

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Welcome Back

It's good value for money all the way with our handy compilation of re-released budget games.

By Tony Hetherington

When you go into a shop to buy a game you're usually greeted with a bewildering array of titles; some of which are treasures, others are terrors. For full-priced games the answer is simply to read through *Your Commodore's* review pages and then go out and buy with confidence. Even budget games have the same pitfalls as £1.99 for a bad game is good money wasted. However, if you look carefully you can usually pick up a bargain as you can find games that were top of the full-priced games enjoying a cut-price comeback. Here are ten to look out for if you want to bag a bargain.

Football Manager

Football Manager has got to be one of the most successful games ever. Launched in 1982 on the Spectrum and converted later for the C64 and C16 this game captures the problems of football management and presents them in a ridiculously addictive form. Although the game was written in Basic the snail pace action didn't deter it's players staying up all night to play just one more season I don't think my neighbours will ever recover from the time I won the league and cup double!

The good news is that Addictive Games is adding the finishing touches to Football Manager II, and even better news is that you can pick u a copy of the original from Prism Leisure for only £2.99.

Touchline:

Title: *Football Manager.* ***Supplier:*** *Prism Leisure Corporation, Unit 1, Baird Rd, Enfield, Middlesex, EN1 1SJ.* ***Machine:*** *C64.* ***Price:*** *£2.99.* ***Originality:*** *7/10.* ***Playability:*** *10/10.* ***Graphics:*** *4/10.* ***Value:*** *10/10.*

Decathlon

One of the first, and in my opion, the best of the decathlon games has been re-released as part of the Firebird £1.99 range. Both you and your joystick must endure a punishing schedule of events that includes the 100m, 110m hurdles, long jump, high jump, pole vault and the exhausting 1500 metres. The key to success is joystick waggling so make sure you have a stick that can stand the pace before you attempt to go for gold.

Touchline:

Title: *Decathlon.* ***Supplier:*** *Firebird, 64/76 New Oxford Street, London WC1A 1PS.* ***Tel:*** *01-379 6755.* ***Machine:*** *C64.* ***Price:*** *£1.99.* ***Originality:*** *7/10.* ***Playability:*** *10/10.* ***Graphics:*** *6/10.* ***Value:*** *10/10.*

Boulderdash

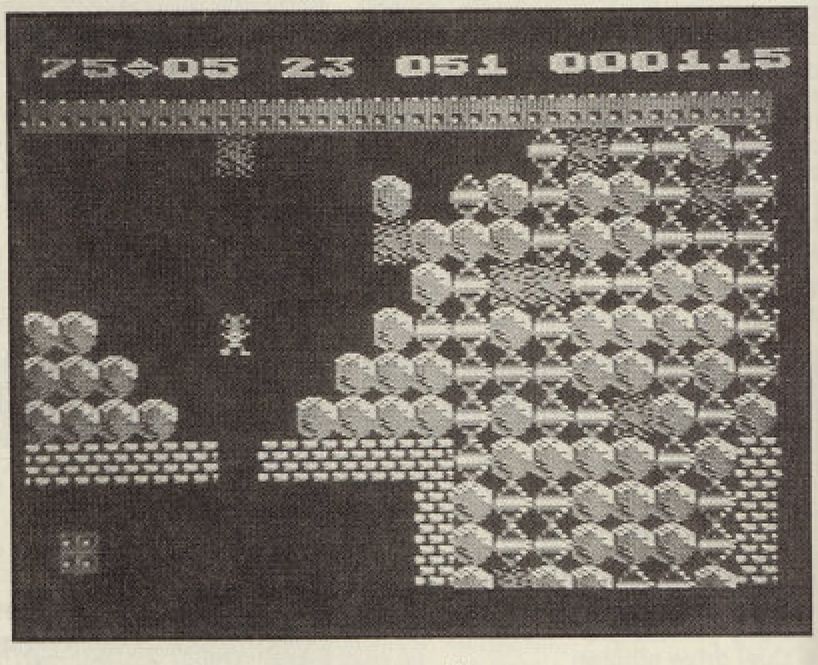
Boulderdash is one of my all time favourite arcade games and has everything that an arcade game should. It's simple to learn, horribly addictive, presents you with fiendish puzzles that you must solve in a race against the clock and it drives me mad!

The star of the game is Rockford, a little character that must collect diamonds while avoiding crushing boulders and deadly amoebas, fireflies and dragonflies.

Boulderdash was originally written by First Star and imported by Beyond and now is back for a well-deserved encore courtesy of Prism Leisure.

Touchline:

Title: *Boulderdash.* ***Supplier:*** *Prism Leisure Corporation, Unit 1, Baird Rd, Enfield, Middlesex, EN1 1SJ.* ***Machine:*** *C64.* ***Price:*** *£2.99.*
Originality: *8/10.* ***Playability:*** *10/10.* ***Graphics:*** *6/10.* ***Value:*** *10/10.*



Attack of the Mutant camels

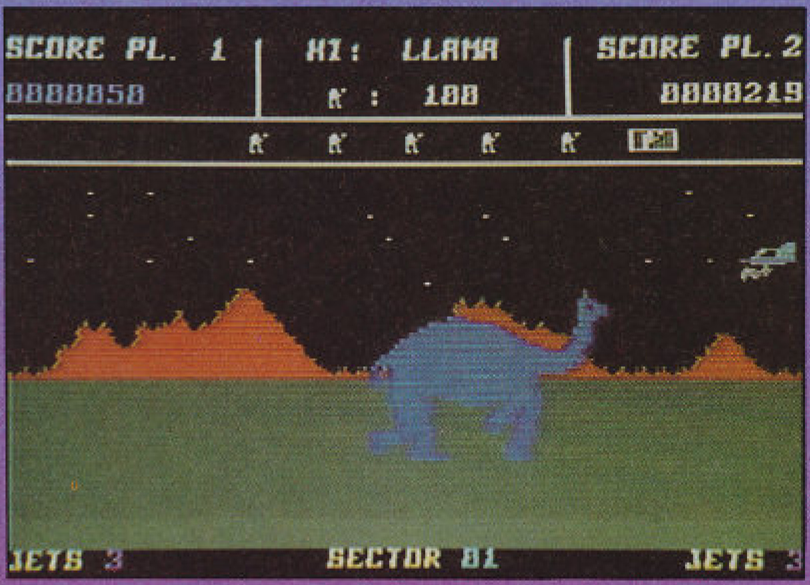
The first and best bout of Minter magic as 90 feet genectically altered camels are sent to destroy the world. Armed with a short supply of high speed laser jets you must take on the massive beasts as they march relentlessly across

the scrolling landscape.

Unfortunately, genetically altered camels are formidable beasts and are coated in many layers of armour, which you must blast away while avoiding the acid bolts that the hairy horrors spit at you. Clear the screen and you'll live to face another batch of conquering camels.

Touchline:

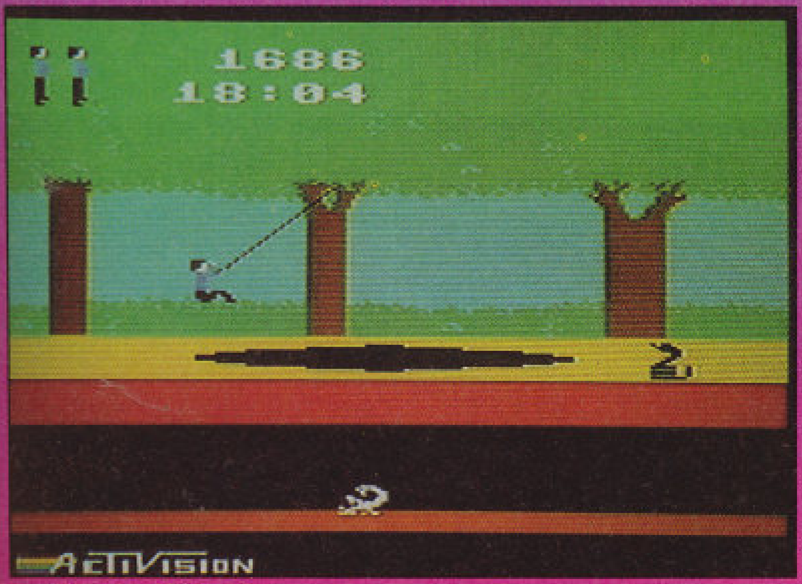
Title: *Attack of the Mutant Camels.* ***Supplier:*** *Mastertronic, 8-10 Paul Street, London EC2A 4JH.* ***Tel:*** *01-377 6880.* ***Machine:*** *C64.* ***Price.*** *£1.99*
Originality: *9/10.* ***Playability:*** *9/10.* ***Graphics:*** *5/10.* ***Value:*** *10/10.*



Pitfall

Another Activision game to be re-released by firebird, Pitfall is one of the few computer games that has been converted and which now appear in the arcades. In the game you play Pitfall Harry, adventurer, treasure hunter and explorer as you make your way through the inhospitable jungle and a subterranean maze that lies below.

As you'll soon find out treasure hunting isn't all that easy as you'll have to leap over barrels, swing on vines over lakes, leap crocodile pits by jumping on their heads and time your runs across the jungle so you're not swallowed up by swamps that come and go. Be warned – this game may look simple but it isn't.



Touchline:

Title: *Pitfall.* ***Supplier:*** *Firebird, 64/76 New Oxford Street, London WC1A 1PS.* ***Tel:*** *01-379 6755.* ***Machine:*** *C64.* ***Price:*** *£1.99.*
Originality: *6/10.* ***Playability:*** *8/10.* ***Graphics:*** *4/10.* ***Value:*** *10/10.*

Fight Night

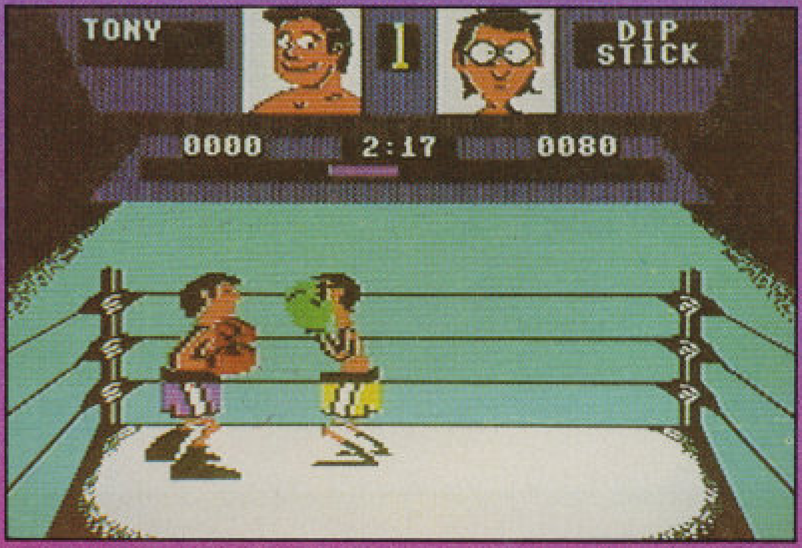
The new look, Mastertronic owned, Americana range boasts and impressive line up including this one for fight fans.

Fight Night allows you to build your own boxer right down to the colour of his shorts and then prepare him for the ring through a tough training and sparing program before tackling the opponents that stand between you and the title. Don't let appearances deceive you as what looks like an easy opponent can have a killer blow.

Treat Dip Stick with more respect than what you think he deserves as his speciality can ruin more than your career.

Toucline:

Title: *Fight Night.* ***Supplier:*** *Americana, 8-10 Paul Street, London EC2A 4JH.* ***Tel:*** *01-377 6880.* ***Machine:*** *C64.* ***Price:*** *£1.99.*
originality: *6/10.* ***Playability:*** *9/10.* ***Graphics:*** *8/10.* ***Value:*** *10/10.*



International Karate

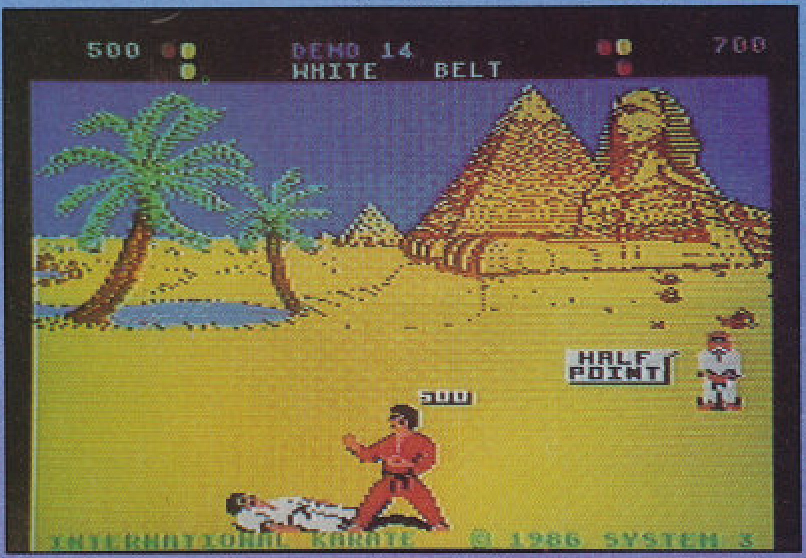
Players who prefer to use bare hands and feet to beat their opponents to a pulp will enjoy System 3's International Karate now re-released by Prism Leisure.

The game flies you around the world from New York to Sydney and on to London and the base of Mount Fuji as you lay into a human or computer controlled opponent with your sixteen Kug Fu moves. Win two out of three 30 second bouts, you could be on your way to a black belt.

Touchline:

Title: *International Karate.* ***Supplier:*** *Prism Leisure Corporation, Unit 1, Baird Rd, Enfield, Middlesex, EN1 1SJ.* ***Machine:*** *C64.* ***Price:*** *£2.99.*

***Originality:** 4/10. **Playability:** 7/10. **Graphics:** 6/10. **Value:** 10/10.*



Forbidden Forest

Take a deep breath and a firm hold of your nerves and dive into this atmospheric nightmare. Armed with only a bow and arrow you enter the forbidden forest to find and defeat the Demogorgon. Through day and night you must fight for your life as a stream of giant spiders, enormous bees, killer skeletons, massive frogs, a fire breathing dragon and the Demogoron himself attack you and aim to bring you to a hideous and bloodthirsty end.

Forbidden Forest may look a little dated but for £1.99 it's worth a look.

Touchline:

***Title:** Forbidden Forest. **Supplier:** Top Ten. **Machine:** C64. **Price:** £1.99.*
***Originality:** 6/10. **Playability:** 7/10. **Graphics:** 4/10. **Value:** 9/10.*

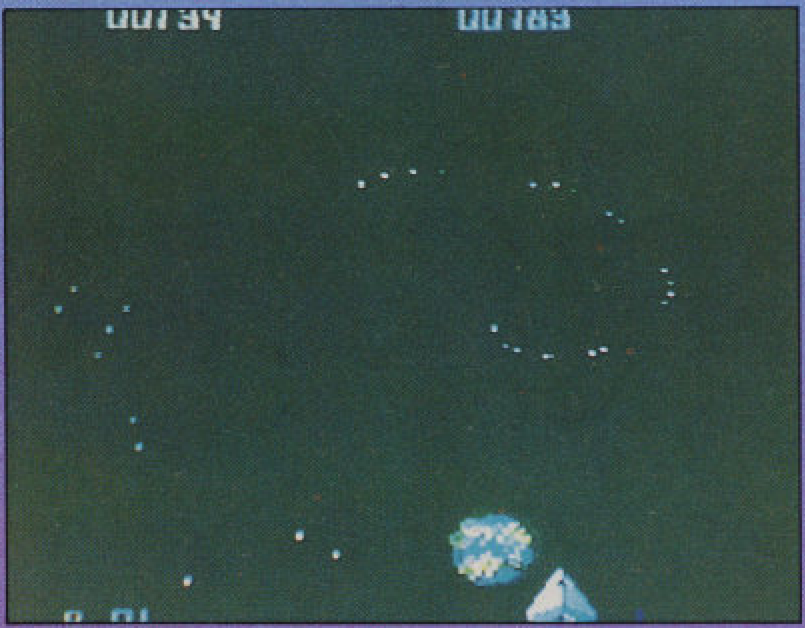


Crazy Comets

The old classic Mad Planets arrived on the C64 through Martech's Crazy Comets and is back again as part of Mastertronic's Riccochet range. Your job is to destroy the new planets that are being formed and then are spinning out of control. The action is fast and furious and accompanied by a Rob Hubbard soundtrack.

Touchline:

***Title:** Crazy Comets. **Supplier:** Mastertronic, 8-10 Paul Street, London EC2A 4JH. **Tel:** 01-377 6880. **Machine:** C64. **Price:** £1.99*
***Originality:** 4/10. **Playability:** 9/10. **Graphics:** 6/10. **Value:** 10/10.*

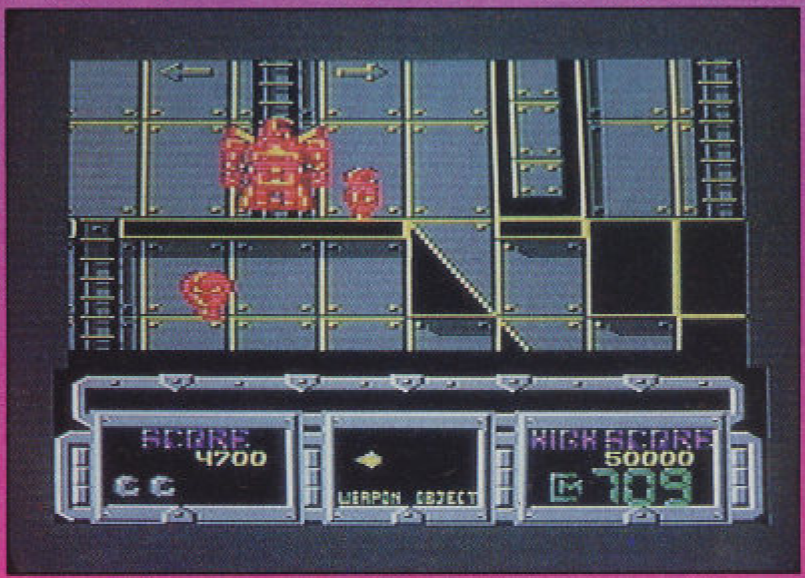


Future Knight

This former Gremlin Game was a challenging mixture of platform panic and arcade skill as you scour a crashed spaceship packed full of evil robots and posionous pools of your beloved maiden in distress. Twenty levels of vertical ladders and scrolling action await the futuristic knight in shining armour.

Touchline:

***Title:** Future Knight. **Supplier:** Prism Leisure Corporation, Unit 1, Baird Rd, Enfield, Middelsex, EN1 1SJ. **Machine:** C64. **Price:** £2.99.*
***originality:** 8/10. **Playability:** 7/10. **Graphics:** 7/10. **Value:** 10/10.*



Sysres

Add hundreds of new functions to BASIC while using only 33 new command words

By Allen Webb

Reviewing this package gave me a deep feeling of nostalgia in that it took me back to the good old CBM PET days. After the initial Palo Alto HELP chips, there emerged a number of advanced tool kit packages; the most notable of these being the POWER chip and VICTREE. Certainly there were a number of similar British products but these were feeble efforts compared to the American packages. SYSRES demonstrates that things haven't changed and is the C64 equivalent to the excellent POWER package for the PET.

Enough of the spiel, what's SYSRES all about? Basically it is a toolkit to allow the easy manipulation of disk commands, programs and files.

First we have extensions to the disk operating system. These are commands which replace the extremely tedious way of accessing the disk.

OPEN 15,8,15,"......":CLOSE 15

These allow you to copy files, scratch files, call the directory, etc by use of simple commands such as @ $ and @S. OK, so that's fairly standard. One rather nice command is the list from disk (@L). This allows you to display a file direct from disk without loosing any programs in memory. The command handles sequential, relative and program files. If you think about it, this is a very handy facility with a wide range of uses.

The remainder of the package comprises about 30 other commands. These range from the usual RENUMBER, AUTO and DELETE commands through enhancements to RUN, LIST and CMD to the positively phenomenal CHANGE. Before describing some of these commands, it is worth making some points about the author's approach to the design of the package.

First of all, this package can be considered to be a true operating system. A range of enhancements such as bi-directional scrolling, key repeat, redefinition of all keys and default devices are wedged into the system. Having done this, the system recognises if you run a program and disconnects and reconnects functions to ensure that optimum speed is achieved.

Secondly, rather than just provide the basic commands, the author has crammed in as many options as his fevered imagination can dream up. RENUMBER, for example, allows you to renumber the whole program, part of it and even move a block of code. Commands such as CHANGE are even more complex.

Thirdly, maximum use is made of the many ways of storing and handling files, allowing some extremely involved operations.

For users of BASIC, there are a full range of editing tools. These include:

DELETE
RENUMBER
FIND
CHANGE
TRACE
DUMP
WHY
APPEND
MERGE

These allow you to write code, run and debug and edit it in a simple manner. Rather than slavishly describe all of these commands, I will mention those which were most outstanding.

FIND: This allows you to look for a specified pattern of characters. The commands is extended, however, to allow you to specify which position in each line to search, specify the areas to search and to specify pattern matching with "wild cards".

CHANGE: This finds a specified pattern of characters and replaces it with another pattern of characters. The command supports all the options of FIND with a claimed 700 valid combinations. The potential of the command is quite phenomenal allowing operations which would normally be very difficult to achieve in BASIC. You can, for example, concatenate lines to longer than 80 characters, remove REMS, find unresolved references or start a line with a number. I found this a potentially powerful command which required a lot of concentration preferably with a cold wet towel wrapped around your head.

TRACE: Most trace commands give some form of a scruffy list of line numbers on the screen which at best is unintelligible and at worst wrecks the screen format. With SYSRES, you have the choice of two optional windows at the top of the screen. The right hand window lists part of each line as it is executed and the left hand one gives the value of each variable every time it is redefined. The options to pause or slow execution or print the windows ease the viewing of the trace.

MERGE: This is a true merge which will interleave the program lines off disk with a program in memory.

For machine code users, these commands are even more useful allowing the preparation and editing of source codes. To allow the manipulation of source codes suitable for use with assemblers such as the

JCL assembler, PUT and GET are provided. This allows you to take advantage of the superior SYSRES functions while maintaining compatibility with the assembler. The PUT command strips off the line numbers and saves the program as a sequential file. Very handy. To aid debugging of machine code, a BREAK line is provided. This is accessed in the usual way via a BRK instruction or from a MON command. If no monitor is present, details of the page where the break occured along with the contents of the registers, etc. are given. If a monitor is present, it is entered. The package comes with a public domain monitor (XMON) with several versions at different addresses. The system also seems to work with other monitors, however. One rather bizarre feature is that the bidirectional scrolling is active, even from within the monitor. This allows you to LIST a source code or BASIC program without leaving the monitor. This offers some useful debugging features.

Those of you who use binary files will know the irritating way that the BASIC pointers are left so that any attempt to LOAD or amend programs get an OUT OF MEMORY error. To allow for this, three commands are provided. BLOAD and BSAVE allow the storage and retrieval of binary files without this problem. BRUN loads a binary file and commences execution at the start address of the code. This command also allows you to transfer parameters, provided that your code requires this. The following syntax is therefore accepted:

BRUN "myfile",parm1, parm2

A slightly stranger method of handling files is provided by the EXEC command. This command is aimed at providing a means of booting key definitions and other more esoteric functions. The BASIC program is saved as a Sequential file which can then be handled by EXEC.

Most toolkits provide a means of redefining keys, and SYSRES is no exception. Generally, these are confined to function keys, but SYSRES, somehow predictably, goes much further. On boot-up, 18 of the alphabet keys are defined with common BASIC and SYSRES commands which are accessed by pressing the LOGO key with the appropriate alphabet key. The KEY command can be used to additionally define most of the keys when used in conjunction with the SHIFT key. Redefinitions can be set up manually or by loading definitions via EXEC.

An important feature of this type of software is the need to give nicely formatted output. When listing source code or BASIC programs, SYSRES uses white for line numbers and the normal ink colour for the rest of the code. The normal scroll is changed so that you cannot accidently lose the screen contents by trying to move the cursor off the bottom of the screen. Instead, where a program is longer than the screen, you can list in either direction – a much more civilized and controlled approach. LISTing long files can be paused by pressing the SPACE BAR or slowed by pressing CTRL.

EXTENDED EDITOR COMMANDS

/	[1]	Quick load from disk
†	[1]	Quick load from disk with auto run
APPEND	[1]	Append from disk to end of current program
AUTO	[1]	Auto line number (allows header)
BLOAD	[1]	Load machine language (binary) file
BRUN	[1]	Load and execute machine language program
CHANGE	[1]	Change pattern to another pattern
CLOSE	[2]	Close one or all files
CMD	[2]	Set output to file (does not send "READY.")
DELETE	[1]	Delete a range of lines from program
DUMP	[1]	Dump all scalar variables to screen or file
EXEC	[1]	Execute a file as keyboard commands
FIND	[1]	Find occurences of a pattern
GET	[1]	Read a sequential file into editor
KEY	[1]	Define a key as a special function
KEYS	[1]	Turn key functions on
KILL	[1]	Disable SYSRES™
KILL*	[1]	Disable SYSRES™ and unreserve memory
LIST	[2]	Improved BASIC LIST command
LOAD	[2]	Defaults to disk drive
MERGE	[1]	Merge from disk into current program
MON	[1]	Break to current machine language monitor
OLD	[1]	Restore program after "NEW"
PUT	[1]	Send program to disk as text file
RENUMBER	[1]	Renumber all or part of program
RUN	[2]	Run current program, ignores screen garbage
SAVE	[2]	Defaults to disk drive, allows replace
SETD	[1]	Set disk device #, allows multiple drives
SETP	[1]	Set printer channel, format mode, paging
TRACE	[1]	Select 1 of 3 trace/step modes and speed
VERIFY	[2]	Compare current program against disk/tape
WHY	[1]	Print position of last error
WHY?	[1]	List line of break or error
*	[1]	Send output to printer
#	[1]	Display current version of SYSRES™

[1] Added command
[2] Old command with improvements

DIRECTORY ORIENTED COMMANDS

/	Quick load disk file
†	Quick load file with auto run
APPEND	Append file to end of current program
BLOAD	Load machine language (binary) file
BRUN	Load and execute machine language program
EXEC	Execute file as keyboard commands
GET	Read file into editor
LOAD	Same as "/"
MERGE	Merge file into current program
PUT	Send text to disk, allows replace
SAVE	Save program to disk, allows replace
VERIFY	Compare current program against file
@L	List file to screen
*@L	List file to printer (allows formatting)
@Cd:	Copy file to specified drive
@Sd:	Scratch file from specified drive

EXTENDED DOS SUPPORT

@ (type "N" keyboard)	These commands may be used
< (type "B" keyboard)	interchangeably, to perform
! (original keyboard)	the following DOS SUPPORT
> (for 'wedge' users)	functions.

@	Display disk status
@N	Format (HEADER) a new diskette
@I	Force initialize diskette
@V	Validate diskette (collect)
@D	Duplicate diskette
@C	Copy or concatenate disk file(s)*
@R	Rename file
@S	Scratch file(s)*
@$	List directory**
@U:	Reset disk drive
@L	List disk file**

For those of you with printers, things are even more attractive. Many commands can be sent to a printer by prefixing them by *. The nature of output and the device are set by the SETP command. By adding 64 to the device number, a formatted output can be obtained. This format option does a number of things:

- Line numbers are right justified.
- Multi-statement lines are split with one statement per line.
- Spaces are inserted between commands.
- FOR-NEXT loops are indented by level of nesting. For example, the following program:

```
90    FORI=1TO20
100   FORJ=1TO20
110   FORK=1TO20
120   PRINTI*J*K
130   NEXT:NEXT:NEXT
```

is printed as:

```
90    FOR I=1TO 20
100   FOR J=1TO 20
110   FOR K=1TO 20
120   PRINT I*J*K
130   NEXT:
      NEXT:
      NEXT:
```

The obvious value of this feature is that you can write a program as compressed as you like and still get a legible hard copy to aid debugging. So far as I could establish, SYSRES does not provide a Centronics driver.

SYSRES is hidden mostly behind the ROMs and uses only a page of memory from $CF00 to $CFFF. No indication is given of zero page or other memory usage so I assume that there are no specific compatibility problems. The manual claims that the program attempts to analyse other cartridges or programs present which might give extensions to BASIC and make appropriate allowances. I tried using SYSRES with the MIKRO assembler casrtridge with no obvious clashes. Clearly, machine code users will need to take care as to which areas of RAM are used by their programs.

Overall Impressions

I admit that I am wary of over praising a piece of software, but in this case, I am hard pressed to fault it. So often I have seen software which dabbled with the jon it's tackling, but falls short due to carelessness or lack of attention to detail. SYSRES is not one of them. The author has gone out of his way to provide a full compliment of features and to ensure that every detail is catered for. The program shows an appreciation of the 64's operation and caters for the unusual but flexible file handling system.

The program comes on disk and not only is it unprotected, but the manual encourages the user to make a working backup. The manual comprises about a 100 pages of text held in an A5 size ring binder. The manual is well printed and reads well. Unlike many products where the manual is the last and most poorly produced item, the SYSRES manual is detailed and offers both examples for use and plenty of hints.

The price may at first appear high but for what is a *tour de force* of programming this is an investment for anybody who wishes to use the 64 to the full.

Touchline:
Product: *Sysres.* ***Supplier:*** *Financial Systems Software Ltd, 2nd Floor, Anbrian House, St. Mary's Street, Worcester WR1 1HA.* ***Tel:*** *0905 611463.* ***Price:*** *£24.95.*

The Alternative Collection

One of the up and coming budget software houses, Alternative Software look all set to topple some of the top ten companies from their perch at the top. Here's your chance to discover how good their games are

By Tony Hetherington

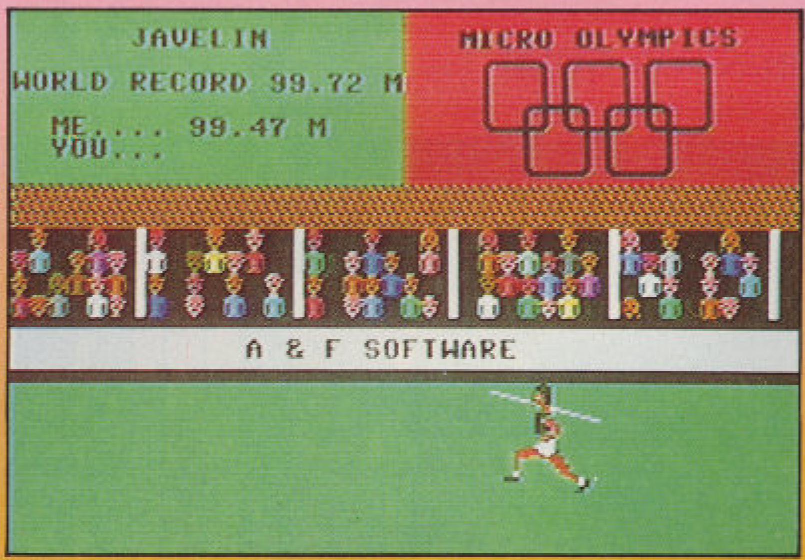
The budget games market is in a turmoil. Once the sole contenders, mighty Mastertronic has competition from Firebird who has just picked up some Melbourne House games such as Rock 'n Wrestle, Penetrator, Mugsy, Mugsy's Revenge and Sherlock Holmes from the Australian Melbourne House. This is even more incredible when you remember that Mastertronic bought the UK Melbourne House! If that wasn't enough the cut price Kings are facing the challenge of Code Masters who has gone from next to nothing to dominating the charts in under a year! Now there is a new player in the arena but can Yorkshire based Alternative Software breakthrough into the big time? As they say, the proof of the pudding is in the playing so we tested ten new Alternative £1.99 games.

JUDO UCHI MATA

A rerelease of Martech's Uchi Mata gives you the fight of your life as you take on a human or increasingly difficult computer opponents at the ancient Japanese art of unarmed combat. Armed with just your wits and a good joystick you must literally get to grips with your opponent so you can then throw him with moves such as Tomoe-Nage, O Soto Gari, De Ashi Barai and, of course Uchi Mata.

To succeed with these moves you have to grab your opponent with a stronger grip than he's got on you and complete a series of joystick moves that will hopefully leave him flat on the mat. At the end of the game your score is accumulated and converted into an award that ranges from white belt to black belt and beyond through the Dans. A good beat 'em up that's a more subtle variation of the kicks and chops of karate.

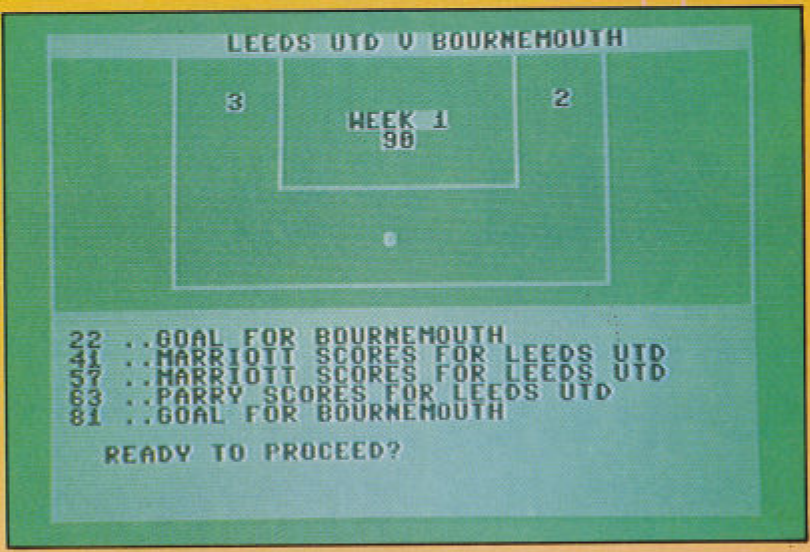
OLYMPIC SPECTACULAR



Eleven Olympic events face keyboard athletes in a rerelease of Database's Micro Olympics that was first released during the Decathlon boom. The events are split into three groups, running (100, 200, 400, 800, 1500 metres), throwing (javelin, discus, hammer) and jumping (long jump, high jump and pole vault).

To play the events you will need a combination of keyboard hammering and timing as you gain speed and jump or throw at the right time and are poorly rewarded for your efforts by jerky basic graphics. The running events can be particularly grueling, both on fingers and keys, as even the 1500m is a sprint!

SOCCER BOSS

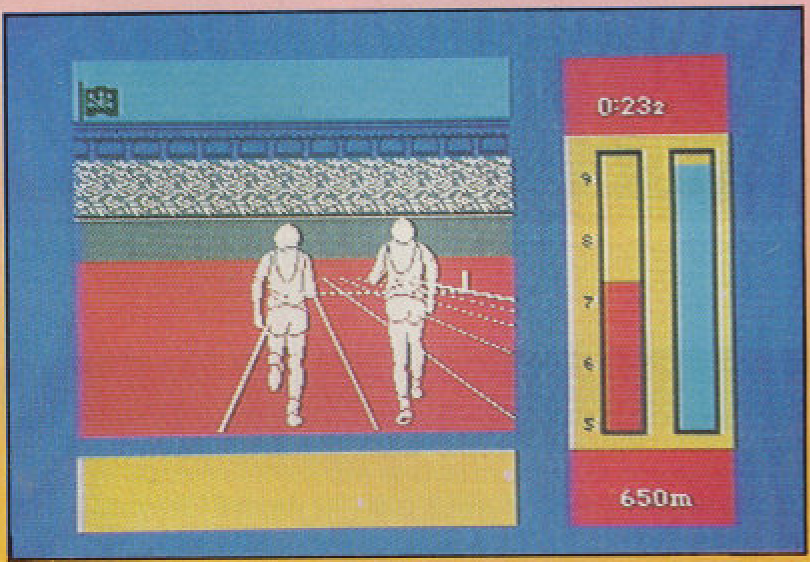


Football Games come and go but Football Manager still rules the sidelines but Soccer Boss offers a good alternative and is £1 cheaper.

The game let's the new manager of Liverpool, Scunthorpe or whatever team you choose to command firmly in the dark with only a few instructions but you'll soon guess the players with the highest skill levels are the ones to pick.

As the game proceeds, you'll have to grapple with the selection problems, injuries and even the gas bill as you strive for league, cup and even European glory. This game was originally released by Peaksoft but they only had six teams in the league, now it's back at a fraction of the cost with full divisions. Here we go, here we go, here we go!

RUN FOR GOLD



Run for Gold is an athletics game in which skill and tactics are as important as your runners speed and stamina. You control two runners whose quest is gold in the 400 and 800, 1500 metres. However, there are forty others who want the same medals.

You begin your quest in local meetings that will qualify you for a race at Crystal Palace, then onto the European Finals and finally the Olympics.

The races are run with you in the centre of the action and you must control your pace and position on the track so that you're well placed for the closing sprint. Makes a change from the frantic waggling of the Decathlon games.

SCARE BEAR



You are Fred Bear trapped in a nightmare brought on by eating a cheese sandwich. Unfortunately, this is no ordinary dream as it's a nightmare and is very real. You are trapped in a car in toyland and are pursued by fluffy snakes, wooden snakes, toy trucks, turtles, joysticks, ghosts and a whole host of other toys that have turned nasty and are out to get you.

Your only defence against this attack is a nuclear honeypot that delivers a toy trashing honey ball as you leap over your victims in your car that can accelerate, break and jump!

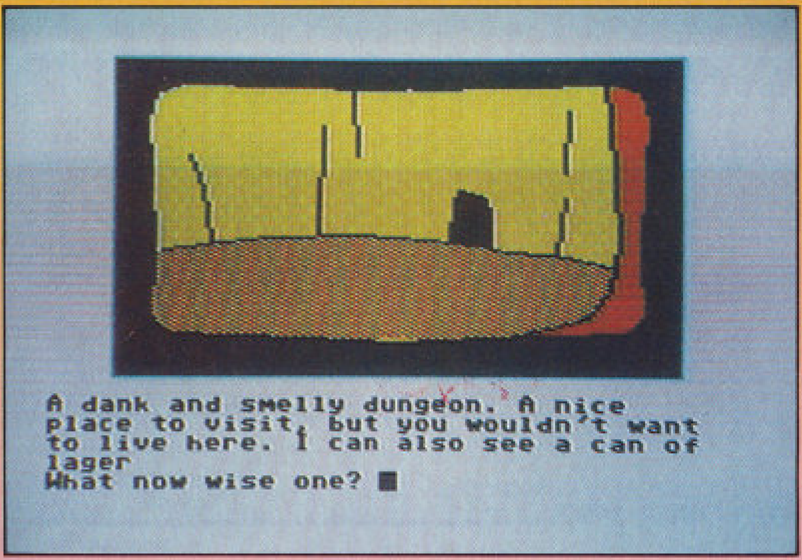
FOOTBALL FRENZY



Football Frenzy is a football game with a difference. There are no joystick controlled players that dribble and shoot or tactics to choose as this is an adventure. Your team,

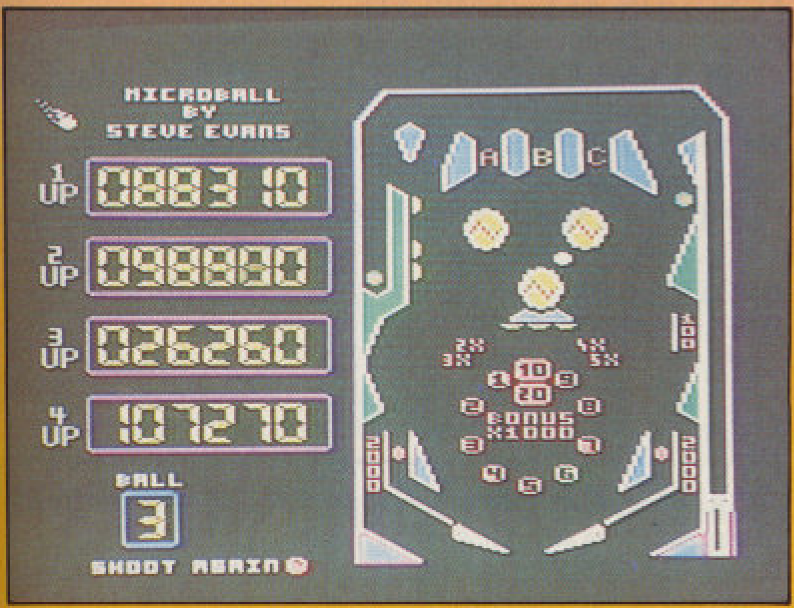
Grimsditch Rangers have somehow managed to reach the Cup Final and as manager you've just three more days before you lead the team out onto the hallowed turf. Surely nothing can go wrong! However, everything does and it's your job to get the team to the stadium on time. Two word command sentences may not seem a lot but there's a lot of adventuring packed into this program for only £1.99.

WIZ BIZ



More budget adventuring for those who like to talk their way out of trouble. In this game of magic and mayhem you come around after a particularly heavy drinking session in the Duck and Plunger. Half-way during the evening you do your usual party piece of turning one of your friends into a black and purple Salamander. When you turned Mike, your victim back to normal he was a curious shape and didn't seem to see the funny side but instead planned revenge. Now you find yourself, complete with hangover, coming around in his Castle and the only thing in view is a can of lager!

MICRO BALL



Being a good snooker player is supposed to be a sign of a mispent youth. Unfortunately, I chose the less profitable pastime of pinball. As a result I have hit more targets, scored more replays and claimed more extra balls than Steve Davis has potted blacks.

Up to four players can play Micro Ball or more likely you can play four games at once as you attempt to keep the ball in play, knock down sets of targets for bonus multipliers and score the 250,000 points necessary for the first extra ball (480,000 and 720,000 bring second and third extra balls).

As the scores rack up, watch out for "out shots" as a bad bounce can send the ball down one of the side channels before you can get to the tilt button.

Micro Ball occasionally defies the laws of physics as the ball seems to stop in mid air and then carries on once the program has worked out where it's going, but for £1.99 pinball wizard's will enjoy this.

CRICKET INTERNATIONAL

There have been very few cricket games released for the C64. However fans of the willow and leather can now play 60 over limited over matches between their own teams or in a match between England and the rest of the world.

As bowler runs in he can decide where to bowl the ball and where to pitch leaving the batsman to judge the flight of the ball, decide the angle of the shot and get the bat to the ball. If you hit the ball you can attempt to run between the wickets. The fielding side can then select a fielder to run for the ball and attempt a run out if they haven't already bowled you.

This isn't an easy game to play; so don't expect to score too many centuries particularly against the computer opponent.

RED ARROWS

Have you what it takes to fly in formation with the world's best display team? Now's your chance to find out as you jump into your Hawk and take to the skies with the elite of the RAF, the Red Arrows.

The game features two parts in which you learn how to fly a Hawk and then fly in formation with the rest of the team. The controls to fly the Hawk can be selected for the keyboard or joystick and include controls for the Hawks thrust and brakes, ailerons and elevators. Once you can keep the plane in the air and on course you're ready to join the rest of the squadron and perform formation manoeuvres such as the Diamond, Pyramid, Eagle and Manhatten. In all these formations you fly a plane at the back of the group so your screen is full of the other planes which can make it difficult to follow.

Touchline:
Alternative Software Ltd., Units 3-6 Baileygate Industrial Estate, Pontefract, West Yorkshire, WF8 2LN. ***Tel:*** 0977 797777.

Software for Sale

If you think that one of our programs looks very interesting, but you can't afford the time to type it in then our software service will help you out.

It's three o'clock in the morning. You sit at the computer Keyboard having just finished a marathon typing session entering one of the superb programs from *Your Commodore*. Your fingers reach for the keyboard and press the letters R, U and N. You press RETURN, sit back and nothing happens.

Everyone has probably faced this problem. When it does happen it's a matter of spending hours searching through the program for any typing mistakes. No matter how long you look or how many people help you, you can usually guarantee that at least one little bug slips through unnoticed.

The *Your Commodore* Software Service makes available all of the programs from each issue on both cassette and disk at a price of £6.00 for disk and £4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available in the relevant magazine. Should you not have the magazine then back issues are available from the following address:

INFONET LTD, 5 River Park Estate, Berkhamsted, Herts HP4 1HL.
TEL: (0447) 76661

Please contact this address for prices and availability.

The Disk

Programs on the disk will also be supplied as totally working versions, i.e. when possible we will not use Basic Loaders thus making use of the programs much easier. Unfortunately at the moment we cannot duplicate C16 and Plus/4 cassettes. However programs for these machines will be available on the disk.

What programs are available?

At the top of each article you will find a strap containing the article type, C64 Program etc. So that you can see which programs are available on which format, you will also find a couple of symbols after this strap. The symbols have the following meaning:

This symbol means that the program is available on cassette.

These programs are available on disk.

Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk-only programs on tape. There is no sense in placing a program that expects to be reading from disk on to tape.

OCTOBER 1987

Shadow Boxing — Use the memory under the C64's ROMS for storage.
Adventure Kit — The first module of our DIY Adventure system. (C64)
Sprite Grabber — Grab Sprites from other programs and save them for later use. (C64)
Hide it — Program protection for C64 owners.

ORDER CODE
DISK YDOCT87 £6.00
TAPE YCOCT87 £4.00

NOVEMBER 1987

ADVENTURE KIT II — The second part of our C64 adventure writing kit.
KERNAL II — A pull-down menu system giving easy file handling. (C64)
FUNCTION KEY TEMPLATE — Use the Commodore plotter to produce templates on your C64.
PLUS/4 AND C16 DISK MENU — Access your disk files with ease (disk only).
128 PREFERENCES — Predefine your computer's default characteristics.
NUMBER TUMBLE — A frustrating game for the C64.

ORDER CODE
DISK YDNOV87 £6.00
TAPE YCNOV87 £4.00

DECEMBER 1987

DISKIT 8 — A memory clear routine for use with our Turbo Cruncher from March 1987 (Disk only).
DISK MANAGER — Pop-Up disk commands at your fingertips (C64, disk only).

RELOCATOR — Alter the load address of your programs (C64).
8 SPEED SCROLL — Powerful machine code scroll routine (C64).
TYPRO — A Plus/4 text editor (Disk only).
EASY COUNT — A word count facility for Easy Script users.
BUDGET CALC — Keep track of your finances (C64, disk only).
SPRITE LIBRARY — The first part of our sprite collection (C64).
LISTER 128 — Produce neat C128 listing with this program (C128, disk only).
TRACK/SECTOR EDITOR — A powerful disk editor (C64, disk only).
DIR COVER — Produce your own detailed disk sleeves (C64 plus disk and printer).
1541 FAST LOADER — Improve your loading time (C64, disk only).
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JANUARY 1988

80 CHARACTER PRINTOUT — Give your C64 80 columns.
QUESTIONNAIRE 1 — An excellent quiz generator for the C64.
ACKROYD'S SAGA— A mathematical educational adventure (C64).
ENLARGING THE 64 — Create large characters on the C64.
ARRAY DISPLAY SUBROUTINES — Improve your C64's INPUT routine.
C64 TAPE SYSTEM — Provide menu driven access to your C64 cassettes.

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FEBRUARY 1988

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ULTRA FUNCTION KEYS — Store up to one screen of text on your C64 function keys.
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GET THE POINT — A simple joystick driven pointer for C64 users.

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Cassettes or disks are available from March 1986. Please ring the editorial office (01-437 0626) for details of these.

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Bone cruncher

Your chance to win one of the hottest games on the market in this month's competition

Superior are now making their mark on the Commodore games market, and this month's competition puts your imagination to the test. Guess the names of the characters from Bone Cruncher and a copy of the game could be on its way to you. We are giving away ten games and a personal stereo to the first ten correct entries pulled out of the hat after the closing date.

How to Enter

Simply allocate the correct name beside the relevant letter and send your entry to the address on the entry coupon.(Hint: our game of the month just happens to be Bone Cruncher!)

The Rules

Entries will not be accepted from employees of Argus Specialist Publications and Superior Software. This restriction also applies to employees' families and agents of the companies.

The How to Enter section forms part of the rules. The Editor's decision is final and no correspondence can be entered into.

Bone Cruncher Competition Entry Coupon

a)
b)
c)
d)
e)
f)

Name ....

Address ....

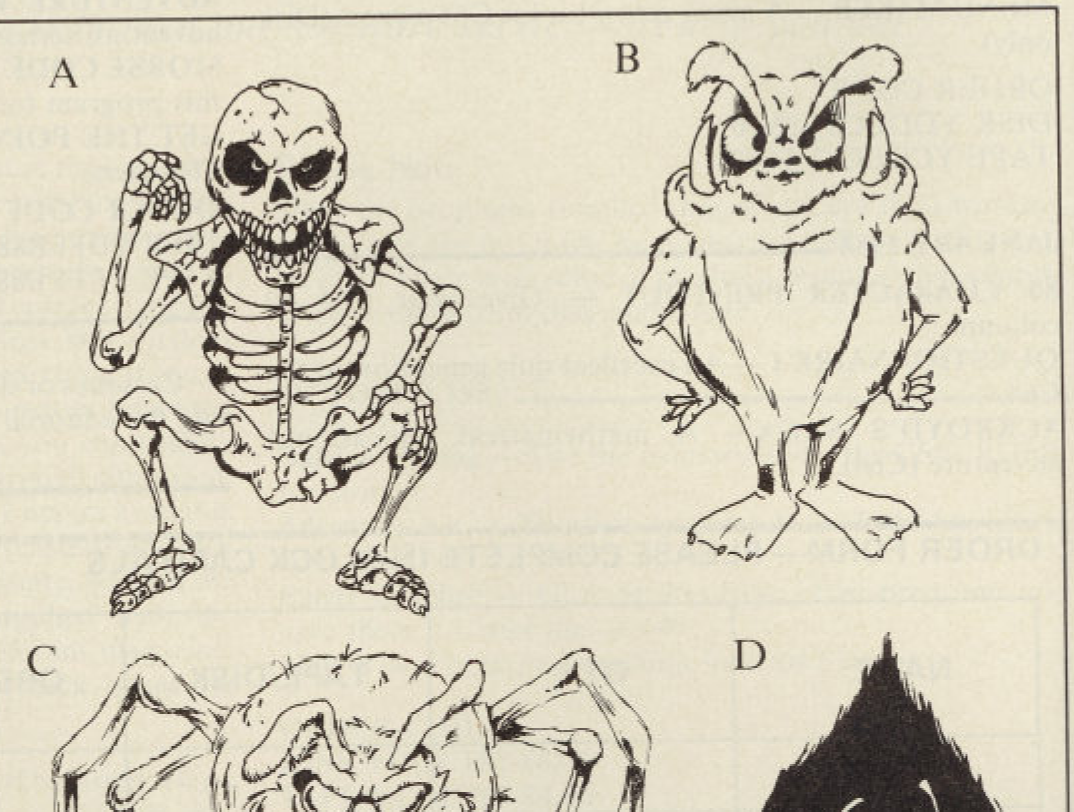
....

....

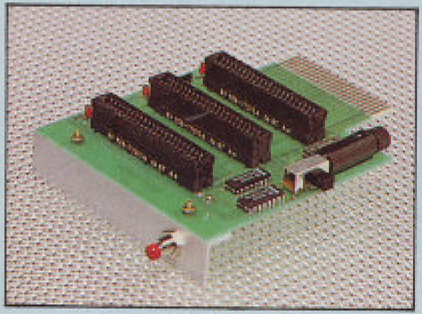
Postcode ....

Post to: *Your Commodore*,
Bone Cruncher Competition,
1 Golden Square, London
W1R 3AB.

Closing date:
Friday 25th March 1988.



DATEL ELECTRONICS



3 SLOT MOTHERBOARD

Save wear and tear on your Expansion Port

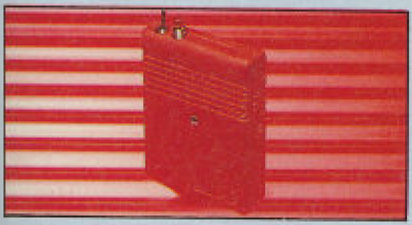
- ❑ Accepts 3 cartridges.
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- ❑ Reset button.

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- ❑ Counter.
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- ❑ Battery backed to last up to 5 years (lithium battery).
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- ❑ Make your own cartridges including autostart types – without an EPROM burner.
- ❑ Can be switched on or off board via software.
- ❑ I/O 2 slot open for special programming techniques.
- ❑ 32K version has 4 x 8K pages.
- ❑ Some knowledge of M/C is helpful – but full instruction are provided.

8K VERSION £14.99
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A series of utility programs for use with Smartcart. Simply load in the program and you have a powerful cartridge. When you have a different requirement – load in another program and you have a new cartridge. The process takes seconds, and can be repeated any number of times.

We intend to release a range of programs. The first available are:

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- ❑ Alternative character set ROM – fitted in seconds.
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- ❑ 100% compatible with all software.
- ❑ Descender. ❑ Eclipse.
- ❑ Scribe. ❑ Future.
- ❑ Choose any set at the flick of a switch.

"For anyone who uses their printer often this chip is a must. It's quick and easy to use and the end results are impressive" – Your Commodore, Jan 87.

ONLY £19.99

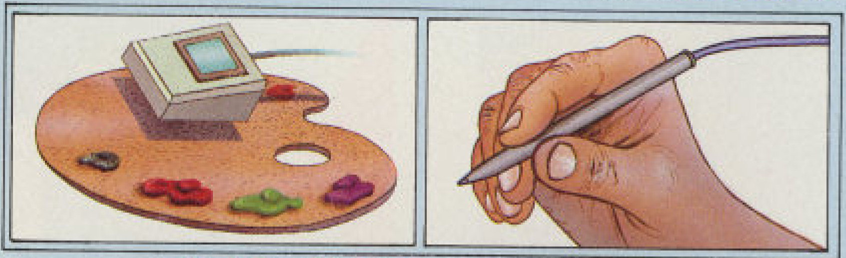


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Turbo Rom II is a replacement for the actual kernal inside your 64. It provides superfast load/save routines.

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- ❑ Saves at 5-6 times normal.
- ❑ Improved DOS support including 10 sec format.
- ❑ Programmed function keys:- load, directory, old, etc.
- ❑ Return to normal kernal at flick of a switch.
- ❑ FCOPY – 250 block file copier.
- ❑ FLOAD – special I/O loader.
- ❑ Plus lots more.
- ❑ Fitted in minutes – no soldering usually required. (On some 64's the old ROM may have to be desoldered).

ONLY £14.99



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A complete lightpen/graphics illustrator package.

- ❑ A fully icon/menu driven graphics package of a calibre which should cost much more.
- ❑ Complete with a fibre optical lightpen system for pin point accuracy.
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  - ● Range of brushes ● Airbrush ● Rectangle ● Circle ● Rubberbanding ● Lines ● Freehand ● Zoom mode ● Printer dump ● Load/save ● Advanced colour mixing – over 200 hues!!
  - ● Cut and paste allows shapes/windows/pictures to be saved to/from tape/disk.
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- ❑ Pictures can be saved from Action Replay and edited with Blazing Paddles.

Complete Blazing Paddles & Lightpen **ONLY £24.99**

Blazing Paddles available separately for **£12.99**

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- ❑ DISK DOCTOR V2 – Read and write any track and sector including extra and renumbered tracks. Repair damaged sectors. Look underneath read errors.
- ❑ HEADER/GAP EDITOR – Decodes and displays ALL header information including off bytes and header gap. Rewrite the entire header and header gap. Renumber sectors. Also edit any sector tail gap.
- ❑ DISK LOOK – Sort directory. Recover lost files. Display file start/end addresses. Disassemble any file program directly from the disk to SCREEN or PRINTER including undocumented opcodes. Edit Ram. Much, much more.
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- ❑ FAST DISK COPY – Copy an entire disk in 2 minutes or less using single 1541.
- ❑ FAST FILE COPY – Selective file copy. Works at up to 6 times normal speed.
- ❑ FORMATTER – 10 second format an entire disk or format any individual track or half track 0 to 41. Redefine any of 30 parameters to create or recreate unique disk formats.
- ❑ ERROR EDIT – Quickly find and recreate all read errors including extra and renumbered tracks or sectors and half tracks from 0 to 41. Even recreates data under errors and allows you to redefine any necessary parameters.

ONLY £9.99

RAM DISK

- ❑ Turn your Smart Cart into a 32K RAM/disk.
- ❑ 32K of instant storage area for files/programs.
- ❑ Load/save instantly.
- ❑ Disk type commands: load, save, directory, scratch.
- ❑ Program data retained when computer is switched off!
- ❑ Full command set with instructions.

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Model & Robot Control made easy

- ❑ Robotek 64 is a comprehensive hardware/software package which enables you to connect your 64/128 to the outside world.
- ❑ 4 output channels – each with onboard relay
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- ❑ Analogue input with full 8 bit conversion.
- ❑ Voice input for voice control.
- ❑ Software features:- test mode/analogue measurement/voice activate/digital readout etc.
- ❑ Excellent value! **ONLY £39.99**

including hardware/software/mic etc. (State tape or disk)



DIGITAL SOUND SAMPLER

- ❑ The new sampler allows you to record any sound digitally into memory and then replay it with astounding effects.
- ❑ Playback forwards/backwards with echo/reverb/ring modulation etc.
- ❑ Now with full sound editing module to produce outstanding effects.
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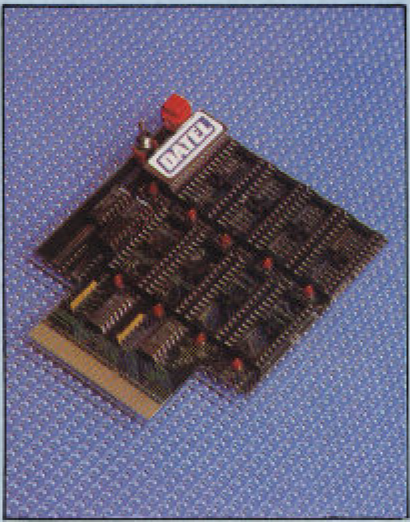
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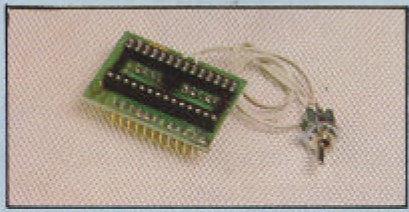
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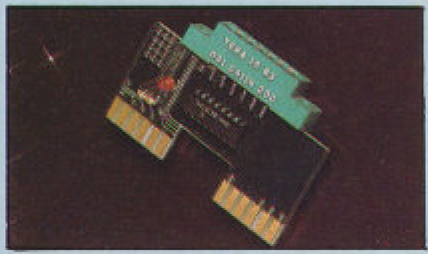


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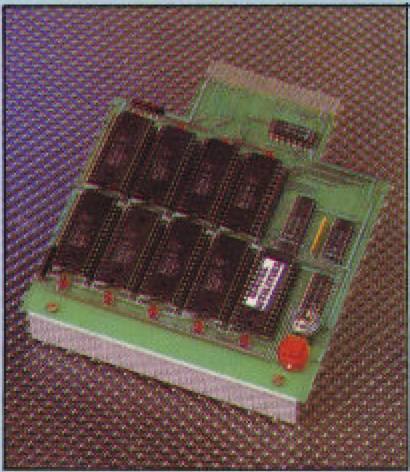
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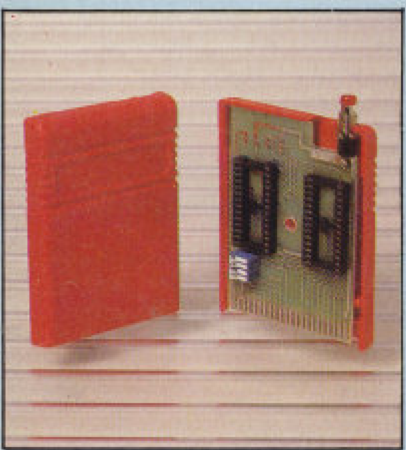
❑ What gives Burst Nibbler its power? Conventional nibblers have to decode the data from the disk before it can transfer it using the serial bus – when non standard data is encountered they are beat. Burst Nibbler transfers data as raw GCR code via the parallel cable without the need to decode it so you get a perfect copy of the original.

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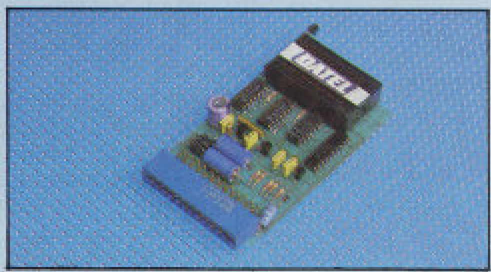
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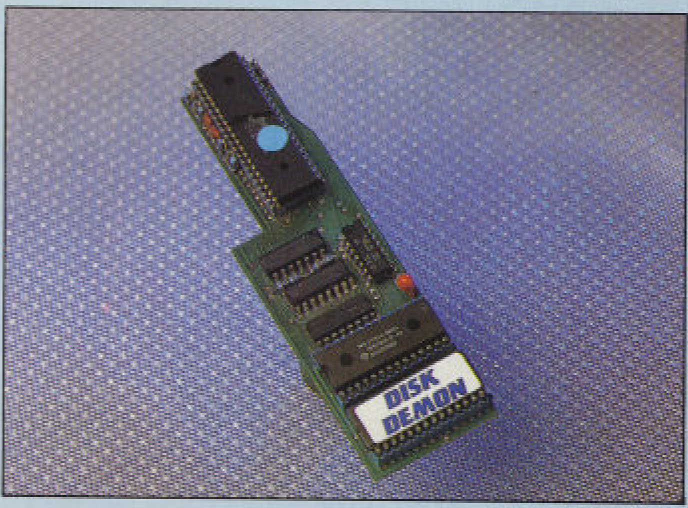


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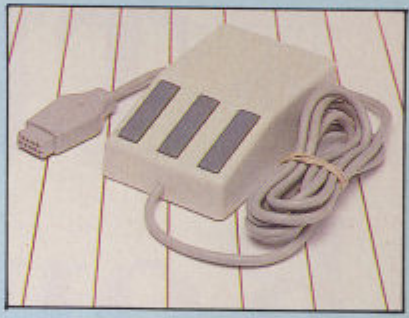


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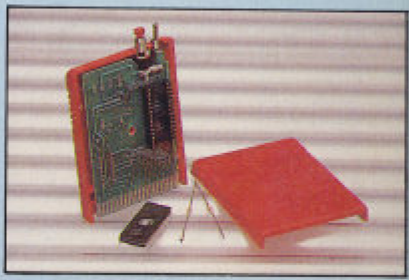
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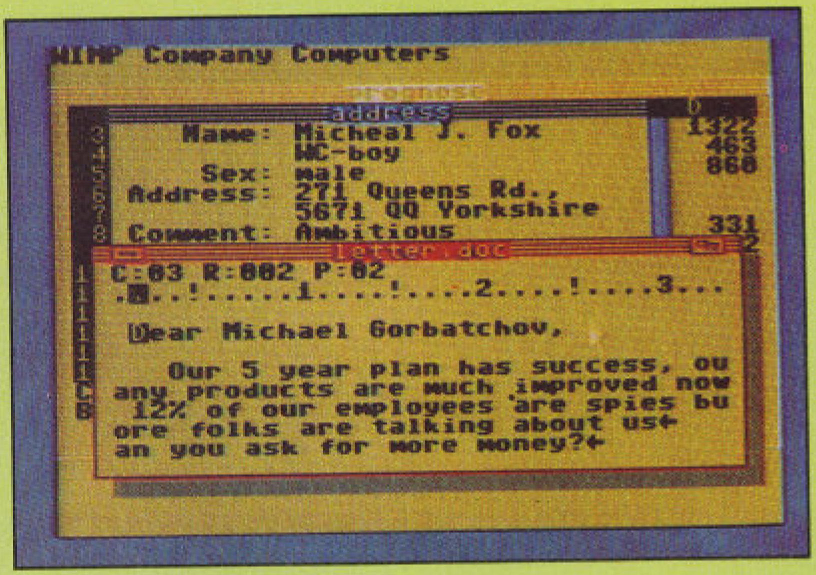
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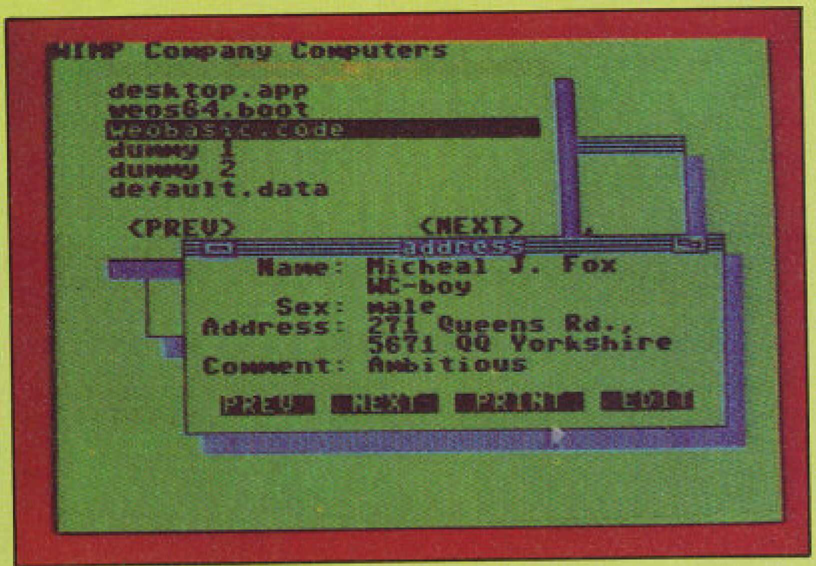
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Through the RoundWindowII

We conclude the instructions for WEOS and give you a demo to play with

By Rony van Hae and Bant Duchesne





Pull down menus, windows and joystick driven pointers are no longer difficult for Basic programmers to access with WEOS. Continuing on from last month's mammoth program we give you the remainder of the programming information you need to use WEOS together with a demo program (at the rear of the magazine) which illustrates how to use some of the WEOS commands.

CHECK LIST

- Due to a small programming mistake you can't define a shadow colour. If you specify a comma after the text string, follow it directly by another comma – you have to use a value or a variable instead.

Wrong: MENU 1,.....,a$,,1,2
Right: MENU 1,.....,a$,2,,1

- The position where the window will be printed depends on all the menus which have a lower number. Sounds confusing? Well it isn't, let's imagine the following:

You've got three menus with the following names:
'DESK','FILES','OPTIONS' as you can see the headers have a length of 4,5 and 7 characters. So the first menu starts at 0 (begin position) and the second menu starts at the fifth position and the last menu at the eleventh position. Each menu will be separated with a space as you can see.

Since the print position is calculated by the other menus, you'll have to be careful with the x-length of the window. Let's imagine the following: you have already defined six menus and the seventh (which you want to add) starts at position 36 but the length of the window is 16, as you can see this wrong because the sum of xp and xl exceeds 40...

- The x-length of the window also depends on the shadow flag, if this is set to one, you have to add 1 to the x-length. So remember: xl+xp+sh may not be greater than 40.
- Watch out that the length of the names of the options may not exceed the (x-length)-2.
- Sometimes when you define menus and you define different colours, you can discover that the inverted option line when you choose an option has two colours!

This is because WEOS will not fill up the remaining gap of characters, to solve this problem, fill each option (after the menu text of course) up with spaces. Try this:

```
10 MENU 1,10,2,1"HEADER←OPT1←OPT2 ↑",5,11,1
20 DESK 94:MENU 1 ON:PAUSE 0
```

Run it and go to an option (first turn your pointer on) and click the button. As you will see the inverted line has two colours! To cure this, modify line 10 to:

```
10 MENU 1,10,2,1,"HEADER←OPT1(4 spc)←OPT2 (4spc) ↑",4,11,1
```

Run it again. This time it is perfect.

MENU(x) : returns menu values
x can be: 1. . .returns selected option
2. . .returns selected menu e.g.
10-20 take lines of the first example of menu

```
30 DESK 94
40 WEOS 2: REM Hunt for symbols & menus
50 IF MENU (0)=0 goto 40
60 SOPEN 10,6:WPRINT"MENU:";MENU (0)
70 WPRINT"OPT:"MENU (1)
80 PAUSE 0:SCLOSE:GOTO 40
```

Run it. Try different menus and options! When you select nothing, MENU(0) and MENU (1) will return a null.

As mentioned earlier this command gives you the first way to read data when WEOS is performed.

• Some people may ask themselves why I added the commands MENU ON and MENU OFF since WEOS 2 does all the work for you. Well this is because some people don't have a joystick or a mouse.

One final note – if you select a menu it is possible that nothing will happen. This is because the computer is too fast. To solve this problem try this:

POKE 39251, delay (1=very fast;255=very slow)

CHECK
Syntax: x=CHECK (a$, asc)
Mode: all.
Output: all.
This is a fairly primitive implementation of INSTR. CHECK scans the string (a$) for a character (asc), if it is found it will return the place in the string where the character is.

This function was added because I didn't include a WINPUT command, you can stimulate it with this command. Look in our desktop program, to find out how we did it.

TYPE
Syntax: TYPE (x)
Mode: all.
Output: all.
This function is the data read function of WEOS.
When you perform WEOS, it changes a lot of data in your computer, to read it out, use this command!
TYPE(0): which type of character has collided with the pointer?
0. . .nothing
1. . .a special symbol
2. . .a menu !
If TYPE(0) returns a zero, TYPE(1) will return wrong values (so you first have to check TYPE(0)).
If TYPE (0) returns a 1, TYPE (1) will return the symbol number.
When TYPE(0) returns a 2, TYPE(1) will work the same as the MENU(0) command. The special symbols are:

Symbol	Value	Poke Code	PETASCII
	1	121 122	185 186
	2	123 124	187 188
	3	93	125
↑	4	30	94
→	5	92	124
↑	6	91	123
←	7	31	95

Symbols 1 and 2 are at both edges of an APW (can be used as CLOSE WINDOW for symbol 1 and MOVE WINDOW for sumbol 2). Symbol 3 is used in most cases as OK symbol, symbol codes 4-7 are arrow codes which can be used as markers or something different (e.g. Preference Manager in DeskTop.)

• The symbols have no special meaning to the computer but to the user, each can have its own meaning and thus you still have to write the routine to perform it.

WSWAP
Syntax: WSWAP
Mode: all.
Output: windows (APW).
This command switches 2 windows, it deactivates the first one and activates the window after it. All operations are now at the new activated window.

• You need at least 2 APWs otherwise you'll get an error, e.g.

```
10 WOPEN 1,1,20,5,"":WOPEN2,3,30,16,"WINDOW2"
20PAUSE 0:WSWAP:WPRINT"Hey. . .": PAUSE 0:WSWAP
30 WPRINT"YES. . ."
```

When there is still another type of window on your screen you will get an error.

WOPEN
Syntax: WOPEN xp,yp,xl,yl,header (,wc(,sh(,sc)))
Mode: all.
Output: screen.
Yes, at last windows. This instruction opens a window; an APW to be precise. When you try to open a window when there is still another window, type on screen (SW or PDM) an error is printed, this also happens if the limit of opened windows is reached (you can open up to 4 APW).

Let's look at the paras:
xp. . . . 0-39
yp. . . . 0-24
xl. . . . 6-40
yl. . . . 3-25
sh. . . . 0-1

xp,yp indicates the cursor position where the window will be printed. xl and yl specify the window size and the sh indicates if a shadow is needed (1=yes,0=no). A 'BAD WINDOW PARAS ERROR' can happen if:
– the paras are out of range.
– the sum of xl+xp+sh exceeds 40
– the sum of yl+yp+sh exceeds 25.

They may not contain any control character (such as colour codes or CR). The header string may not be greater than xl-6, and if you want no header simply create an empty string. The window cursor is now at (0,0). This is the upper left corner of the window, and also means that the maximum characters allowed on a line before it skips to another line is xl-2.

Any screen/window operation is now in this window. (except INPUT, error messages and disk status reports), e.g.

```
WOPEN 2,4,20,10," "
WOPEN 5,10,10,7,"HELLO"
```

wc,sc indicate the colour for resp. window and shadow. Just like the shadow flag those too are optional.

WCOPY

Syntax: WCOPY xp,yp
Mode: all.
Output: screen.
This is almost the same as WMOVE with the exception that the system copies the window to another position (thus creating another window. If there are already four windows on screen and you try to WCOPY you'll get an error. You can only copy APW. The cursor (window) position in the window will be saved and placed on the other new (identical) window on your screen. e.g.
Add following line to the previous program:
40 PAUSE O:WCOPY 7,1:PAUSE O:WMOVE 5,7:WPRINT"YEP"
This will demonstrate you what WCOPY really can do!

If a 'BAD WINDOW PARAS ERROR' occurs see above.

SOPEN

Syntax: SOPEN xl,yl(,wc(,sh(,sc)))
Mode: all.
Output: screen.
This command opens a static window (SW). The only difference between APWs and an SW is that they don't need a start position. It is calculated automatically for you and centred in the middle of the screen (nice hey??). You simply have to specify the window size. When you try to open an SW there is still an PDM or a SW on screen, an error is printed. However, this will not happen if there still is an APW on your screen.

The border of a SW is also different (like any different window type). A SW has the highest priority, (lowest has a APW and a PDM is among them). Well what does this mean? It means that *you have to close it first by SCLOSE before you can use commands such as wcopy or wswap.* And this is the reason why each time you try to open a PDM or APW when there is still a SW on your screen an error is given. The last three paras have the same function as by APW and PDM. e.g.
SOPEN 30,10,4,1:WPRINT"THIS WAS THE LAST INSTRUCTION"

WMOVE
Syntax: WMOVE xp,yp
Mode: all.
Output: screen.
A window manipulation command alters the draw pointer to another position. If a bad paras error occurs look at WOPEN for explanation. If no window or a wrong type is present on your screen, an error report is printed, e.g.
10 WOPEN 2,2,10,6,"MOVE",2,1,12: PAUSE 0
20 WMOVE 4,7:WPRINT"MAGIC"
30 PAUSE 0:WMOVE 9,10:WPRINT "HELLO"

Coming Soon

You now have all of the programming information required to put WEOS to use. The demonstration program in this issue should make use of the program even easier.

In the next instalment, WEOS will provide you with a desktop environment, written completely in WEOS BASIC.

Should you produce any utilities yourself using WEOS BASIC please send them in.

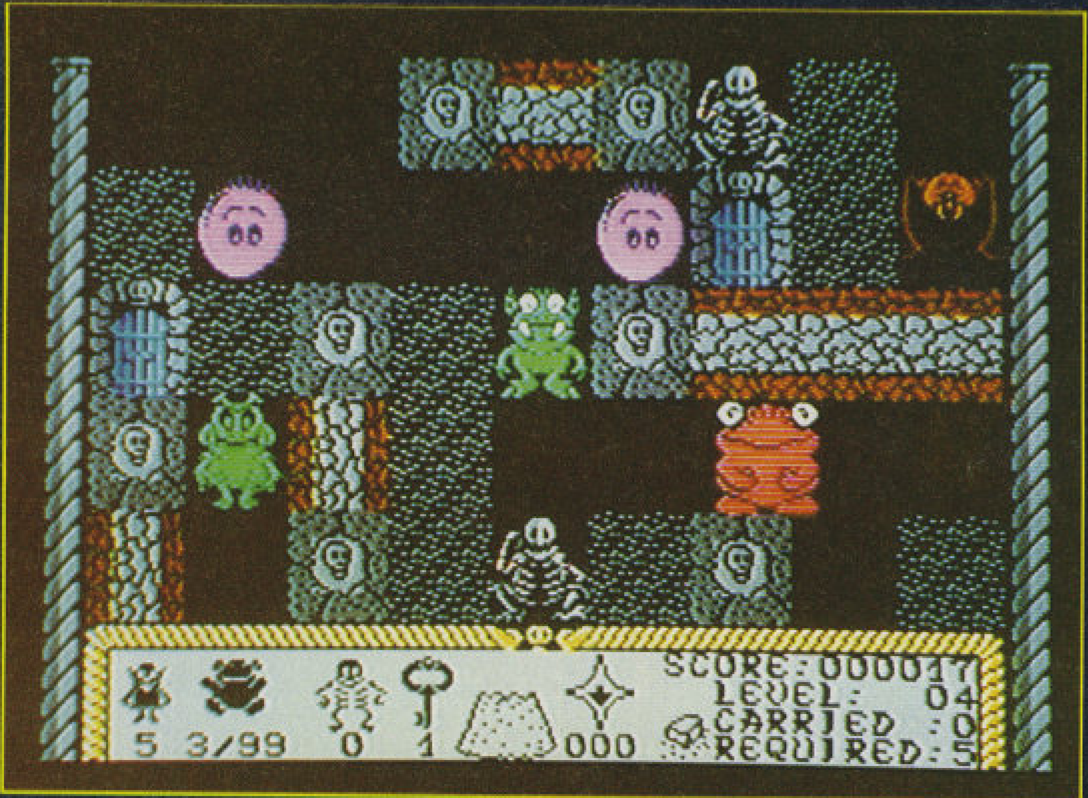
See listings on page 102

YC

Bone Cruncher

All good clean fun in this month's star release – but only if you can master the art of making soap!

By Tony Hetherington



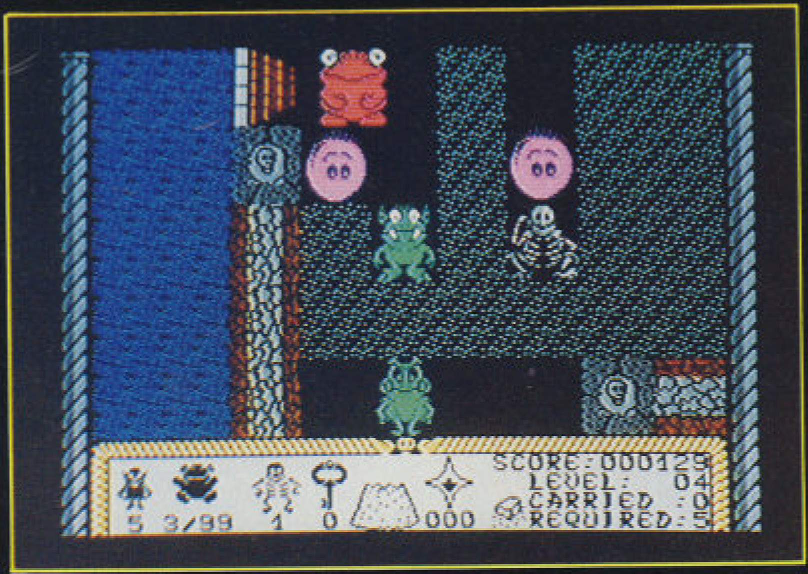
Bone Cruncher is a soap opera with a difference as the star of the show is a dragon called Bono who makes a nice little earner by collecting skeletons to make soap that he then sells to the monsters bathing in his castle's moat.

Your job as Bono is to keep your customers happy by generating a constant supply of soap. You can get limited help from your business partner Fozzy whose the equivalent of a heavy, but since he's not too bright you're on your own most of the time.

The headquarters of the "Bono Bathing Company" is your dark, dank and dingey castle and the game is set in a series of increasingly difficult chambers. There are 22 chambers to be solved and if you manage to complete them all you will win a portable stereo! That's how confident Superior Software are that you'll fail!

Each chamber is a maze of walled off rooms that are filled with earth which our hero can dig through. There are also doors that can block the way until the key is found and then used properly! Skeletons have to be collected, as do cauldrons which turn them into soap; staricases that lead up to the bathing monsters and deadly monsters, spiders and glooks tht populate the caverns and can kill you with a single touch and trapdoors that lead to oblivion!

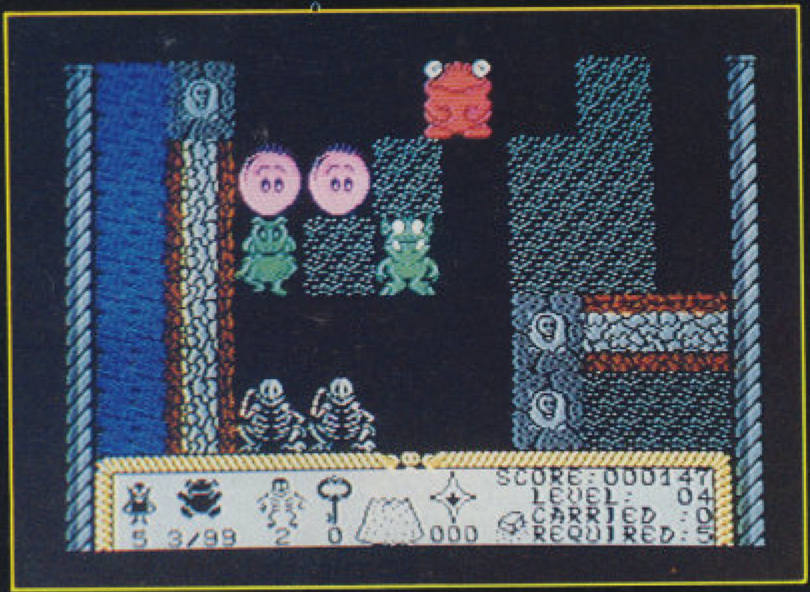
To complete a cavern you must concoct the required



number of soaps by taking skeletons to cauldrons and then delivering them to the staircases. However, blocking your way stands a mind-mangling array of puzzles with the monsters featuring at the top of the list.

Monsters are killed whenever they are trapped and turn into incredibly convenient skeletons that can be added to your store to make more soap. That may sound simple but juggling the joystick movements required to trap a monster is far from easy and involves strategy, tactics, a lot of trial and error and glooks!

Glooks are round purple blobs, with two sullen eyes and a bad spiky haircut that spend most of the game being pushed around (by you) when they frown in disgust. Glooks don't move very much but they do float towards the smell of

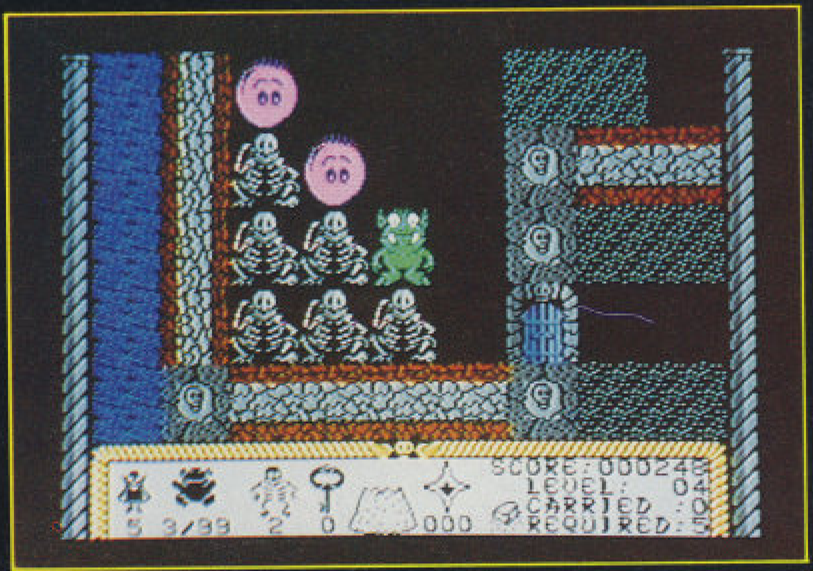


bathing monsters, and since this is determined by the direction of the last staircase you delivered soap to, you have limited, but important, control over the game's glooks. By pushing glooks and anticipating the direction they will move as you deliver soap to staircases you can trap monster's open entrances to new parts of the cavern but can also trap yourself and Fozzy. If you trap yourself then your only way out is to sacrifice one of your five lives to restart from the last soap delivery, if Fozzy is trapped then his energy plummets and he loses one of his three lives. Fozzy may not be important in the early levels but later in the game is immunity to monsters and his ability to grab them is invaluable as it either allows you to push a glook onto a collared monster to trap and kill or simply to get past alive.

Spiders are a little trickier as although Fozzy is invulnerable to their touch he can't grab them, neither can they be killed and to make things worse, a spider will eat any skeletons it can which could cost you the game. No skeletons, no soap I'm afraid. Luckily, if you keep your mind in gear you shouldn't run into too many troubles since spiders always cling to the left hand wall and so you can predict their moves and even get them going around in circles.

The early levels are relatively simple and if you look before you leap you should be able to collect all the skeletons you need to keep the bathing monsters in soap. However, the game suddenly throws you in the deep end. There just aren't enough skeletons so you have to set about making some out of dead monsters.

However to move the glooks to kill the monster also blocks crucial passageways trapping either you or Fozzy and the few skeletons that are there are either buried in a solid block of glooks in a locked room or you have to run the



gauntlet of spiders to reach them. To make things worse you KNOW there must be a solution! Then, just when you're so annoyed that the C64's about to fly across the room you try one more plan, ludicrous it may sound, it might just work. It doesn't, but you're hooked again.

A few hours, days or weeks later you'll finally solve it and the whole process starts again. At the end of each level the game gives you a password that you can type in as a shortcut through the levels you've already completed. However, you may find it useful to practise these conquered levels occasionally as to win the personal stereo you have to complete all 22 caverns in a single game!

Bone Cruncher will be compared to Superior's own Repton series and other Boulder Dash style games. Although it is set in a series of caverns in which the hero digs out dirt to collect skeletons or diamonds other game elements such as Fozzy, the glooks and the way you must turn monsters into skeletons creates a game that is out on its own. Add functional but funny graphics (such as the Glooks grimace when you shove them or Bono scratching himself while he's waiting for you to work out your next move), a catchy tune and digital speech introduction and you have a game that you must not miss.

Touchline:
Title: *Bone Crusher.* ***Supplier:*** *Superior Software, Regent House, Skinner Land, Leeds, LS7 1AX.* ***Tel:*** *0532 459453.*
Machine: *C64.* ***Price:*** *£11.99 – disk only.*
Originality: *9/10.* ***Playability:*** *10/10.* ***Graphics:*** *7/10.* ***Value:*** *10/10.*

Music While You Load

Loading from tape can be boring. Add a little music and a few effects with Musiload

By P. A. Croton



Musiload is an interactive program designed to relieve the boredom of loading from tape. It not only plays a tune of your own making but also has special joystick controlled features which operate while the program is loading.

The program can be used as an independent loader or as part of a loading chain; using a short program to load and initialise Musiload and then to load the program you actually want to use. While your program loads you can sit back and alter the speed and volume of the music or control the rate at which the border flashes. Almost without realising it your program will have loaded.

Keying In The Program

If you have a copy of the *Your Commodore* HypaBasic program you will be able to enter Assembler Musiload without any alterations. If you haven't got this excellent assembler then you will have to resort to a second method.

Type in Assembler Musiload but omit lines 2, 10, 15 and all lines from 20 to 999 inclusive. When you have finished, Musiload D/S must be typed in while the modified Assembler Musiload is still in memory. In this way, the two programs will be merged into one which can then be saved.

The machine code saver built into the program saves the full Musiload code. Line 8120 defines the name under which this code will be saved as N$="MUSILOAD" but you may change it to suit your needs as long as the new filename is only eight characters in length.

How to use Musiload

When you run Musiload you will have to wait for the code to be read into memory. Ater this pause, you'll have the choice of either accepting the preset tune or of writing your own using the Music Editor.

Whatever your choice, you will eventually be asked if you want to save the tune or go straight ahead and load your program. If you choose the latter option don't forget that your tune will probably be lost once the program has loaded! If you write your own tune always save it first.

Saving, stores the block of memory which contains the working copy of Musiload plus its tune, and this can be found between 49152 and 53247 ($C000-$CFFF).

When you load the Musiload code back into the computer, it can be set into operation with SYS49152. This starts up the musical interrupt routines and then hands back to the normal C64 mode but with the music playing and the border flashing. Now you type in the usual LOAD command and your program will start to load.

While this is happening you can refer to Table 1 to see the range of controls that your joystick will give you.

To add a more professional effect to your loading you could save the following short loader to load a Basic program:

```
10 PROG=PROG+1
20 IF PROG=1 THEN LOAD
"musiload",1,1
30 POKE 631,147: POKE 632,82
POKE 633,85: POKE 634,78: POKE
```

635,13: POKE 198,5
40 IF PROG=2 THEN SYS49152: LOAD "filename",1,1

The program filenames can be changed to suit your needs.

Nomatter which program loading method is chosen, you should either type SYS49800 before running your program or make sure that it appears as the first line or else the Musiload may create strange effects on any sound routines that you use.

Using the Music Editor

The Music Editor has six options:
ENTER NOTE This allows you to input for each of the three voices of the SID chip in turn. The notes are written in the form of note value followed by the octave number: C£5, G2

There is no provision for flattened notes so B flat in octave three will appear as G£3.

When you have entered three notes, a duration common to all of them has to be entered. This can have any value from 1-255.
ERASE NOTE If a wrong note has been entered it may be erased using this facility. Enter the note of the section to be erased and it is removed while all of the other notes are pulled back to fill up the gap.
INSERT NOTE Write down the las' note number of your tune. Then decide which notes the insertion will fall between and type in the lower of the two note numbers. This will open up a space in memory for the new notes and places you into the Enter Note option. Type in the new values and you will return to the menu.

The following step must *always* be followed when an insertion has been made whether you've finished the rest of the tune or not. Re-enter the Enter Note option, add two to the value you wrote down at the beginning of this option and type it in. This will reset the program pointers to the end of your tune. If you don't do this you will lose the rest of the tune from the insertion point.

If your tune uses all 460 note positions and you try to insert more, then the last note will be lost each time you make a new insertion.
VIEW NOTES Using this option you can view all of the notes that you have entered from any specified note number. NU means that no not has been entered into that position.
PLAY NOTES Does just that!
FINISHED Brings you back to the SAVE option.

Musiload does not disturb any of the registers and only uses zero page locations 251 to 254 ($FB-$FE).

Use it to make your programs appear more professional and turn loading time into a pleasure rather than a chore.

Table 1

Without Fire Button Pressed

UP	autoflash on
DOWN	autoflash off
LEFT	volume decrease (cyclical)
RIGHT	volume increase (cyclical)

With Fire Button Pressed

FIRE	flash border
UP	increase flash speed
DOWN	decrease flash speed
LEFT	increase music speed
RIGHT	decrease music speed

Plus/4 Assembler

Serious software for Plus/4 users is sadly lacking serious software. We come to the rescue with a superb assembler

By Steve Carrie

The Commodore Plus/4 enjoyed a surge of popularity due to exceptionally low pricing but unfortunately still suffers from an acuate shortage of software compared with its more successful predecessor, the Commodore 64. This is certainly true in the area of utilities, although to be fair, the Plus/4 does come equipped with a pretty good, although basic machine language monitor (MLM).

The program I have written is a two-pass symbolic assembler which is disk-based, i.e. it reads its source code from a disk file and writes the assembled code to another disk file. The source file is assumed to have an MSDOS-type file extension .ASM. The rununit (assembled code) has the extension .EXE. For example, when the program runs, it asks the user for a filename. If you enter PROG1 and press return, the program will assume that the source file is called PROG1.ASM and will produce a rununit with the name PROG1.EXE.

The load address of the rununit is the address given in the assembler directive ORG (code origin). You should therefore ensure that the correct address is given here. The code address defaults to $0000 in the absence of the ORG directive. When assembled, the rununit is loaded by either the MLM 1 command or be a BASIC LOAD with a secondary address of 1.

Given the disk-based nature of the assembler, fairly large source code files may be used. The Plus/4 allows about 60K of BASIC. Thus the same amount is available to source code programs since the normal BASIC editor is used to prepare programs.

Getting it all in

The program is presented as a BASIC loader with lots (!) of DATA statements. Each line is checked against the checksum value but it's still a good idea to make use of the *Your Commodore* loader program. Should a problem occur, the line where the fault was detected will be printed. Before typing in the program, you will have to move the start of BASIC upwards in memory by 4K. Type in the following direct command:

POKE 8192,0:POKE 43,1:POKE 44,32:NEW

This moves BASIC up to 8192 in memory. If you are typing in the program in stages, you must remember to type this in every time before you start.

When the program has been typed in, SAVE it first then RUN it. If all is well, the program will be built in memory and SAVED to disk.

Reset the machine then load the new program. The assembler has been designed to LOAD and RUN like a BASIC program at the normal BASIC start address ($1001) and will return to BASIC when assembly stops. You are asked for the filename which, as mentioned before, is assumed to have the file extension .ASM. During Pass 1 the assembler will only print something if an error occurs. If this happens then the line in which the error occurred is printed along with an error message.

During Pass 2, a full listing is output to the screen. Any error is shown AFTER the line in which it occurred and assembly stops.

Editing your program could not be simpler. You simply use the Commodore BASIC editor with line numbers as you would for a BASIC program. However, there is a catch... (things would never be the same without a problem or two...!). Normally, the Commodore line editor tries to tokenise anything in the input line which looks like a BASIC reserved word. As certain assembly mnemonics contain character sequences which resemble BASIC commands, we have to prevent this happening. The program "EDIT" is a small BASIC loader with a machine-code program in DATA statements. When it is loaded and RUN, it causes a bypass of the tokenisation routine for program lines only. This means that direct commands such as DLOAD, DSAVE, RENUMBER, etc. will still work OK but *DON'T TRY TO LIST OR EDIT A BASIC PROGRAM WITH EDIT INSTALLED OTHERWISE YOU'LL GET SOME REALLY WEIRD RESULTS!!!!!!*

Assembler Directives and Formats

There are six assembler directives:

BYT Assemble bytes to memory. This directive also allows text to be entered. Typical examples are:

```
10 byt $93,'Hello CBM',$0d,$00
20 byt 23,24,$19,$1a
```

WOR Assembles 2-byte words to memory. Bytes are arranged in lo-byte, hi-byte order.

```
10 wor $0071,32768,vectorl
20 vectorl wor $3000
```

This example also shows how symbols may be inserted into WOR and BYT directives.

EQZ The eqz directive allows you to associate a symbol with a zero page memory location. When referred to later, this symbol will assemble in zero page addressing mode.

```
20 pointerl eqz $14
```

EQA The equ directive allows you to associate a symbol with an absolute memory location. When referred to later, this symbol will assemble in absolute addressing mode.

```
40 .irqvector eqa $0314
50 .nmivector eqa irqvector+2
```

RES The RES directive allows an area of memory to be set aside for a table of some such thing. It simply adds the amount specified to the assembly program counter.

```
100 .table
110 res 100
120 ;
```

ORG This directive sets the code origin in memory. Because the disk system uses this to set the program load address, it is advisable to use this as the first line of any program.

```
10 org $6000
```

You may insert comments into a source program using the semi-colon. As you may have noticed above, symbols are declared using a full stop. When referred to later, only the name need be given.

Assembly Language Formats

Immediate operands are assumed to be preceeded by the hash (#). Hexadecimal numbers may be prefixed with either the dollar or ampersand ($,&). Ascii characters may be inserted into something like LDA # 'A'. This will load the ascii code value of the letter A. Decimal numbers have no prefix thus LDA # 30 will assemble to load the accumulator with 30.

As mentioned above, symbols must be declared using a full-stop, for example:

```
10 org $7000
20 .lomen=$1001
30 .himen=$fe00
40 ;
50 lda #< lomem
60 ldx #< lomem
70 sta himem
80 stx himem+1
90 rts
```

In this example, you see that the symbols and may be used to load the lo-order or hi-order byte of an operand respectively. Also you may add or subtract values as in line 80. Note that in a line such as LDA #< memory+, the "memory+1" is evaluated BEFORE the operator takes effect.

(A Commodore 64 version will appear in a subsequent issue.)

See listings on page 102

LIFESAVERS 7	C64	SPRITES IN BORDER	1/1

There are many games today which include sprites in the border to display scores etc.

The routine presented here will allow you to do just that.

The program sets up an IRQ to check when the screen raster line is at 249. When it has reached this, bit 3 of memory location 53265 is cleared so that 24 row mode is possible. This has the effect of making the bottom border disappear.

The raster will continue to the top so that th top border will also disappear.

When the raster has reached 0, bit 3 of location 53265 is set to 1. This sets up 25 row mode and the screen is displayed as normal.

POKEing various values into memory location 16383 allows you to create some weird effects.

By G.Saunders

```
10 REM ************************
20 REM    SPRITES IN BORDER
30 REM ************************
40 BL=4:LN=50:SA=49152
50 FOR L=0 TO BL:CX=0:FOR D=0 T
O 15:READ A:CX=CX+A:POKE SA+L*1
6+D,A:NEXT D
60 READ A:IF A><CX THENPRINT"ER
ROR IN LINE";LN+(L*10):STOP
70 NEXT L:END
80 DATA 120,162,33,160,192,142,
20,3,140,21,3,162,1,142,13,220,
1534
90 DATA 142,26,208,202,142,18,2
08,173,17,208,41,247,141,17,208
,88,2086
100 DATA 96,162,1,142,25,208,17
3,18,208,201,249,176,16,173,17,
208,2073
110 DATA 9,8,141,17,208,169,249
,141,18,208,76,129,234,173,17,2
08,2005
120 DATA 41,247,141,17,208,169,
0,141,18,208,76,49,234,0,0,0,15
49
130 SYS 49152:REM START PROG.
```

The Choice of Modem

There are a number of factors to be taken into consideration when entering the world of communications. Here we look at two modems at opposite ends of the price scale

By David Janda

The modems we will be looking at are the Kirk Enterprise 1 and the Pace Series Four 1200S. Before describing each modem in turn, it's worth pointing out the hardware/software that is used with these modems, as neither one was specifically designed for use with the Commodore 64/128.

Kirk recommended the Mustang 64 Communications Cartridge (V2.1) from Y2 Computing for use with the Enterprise 1 modem. This item plugs into the cartridge port and offers viewdata and scrolling terminal facilities. However, because the Enterprise 1 is equipped with a female 25 way D-type RS232 connector, it is not essential that the modem be used with the Y2 software.

Indeed, to test the 1200 baud half-duplex capability of the Enterprise 1, I interfaced the modem to the 64 via an RS232 interface which plugs into the user port of the 64/128. The software used with the interface was HomeTerm which is part of the HomePack integrated suite of software from Ariolasoft.

Basically the same applies with the Series Four. It too is equipped with a female RS232 connector, and can be used with the Y2 cartridge, or connected to the 64/128 via an RS232 interface. For the purpose of this review, the Series Four 1200S was tested with both the Y2 software, as well as HomeTerm.

Commodore Connection

This choice of connecting a modem to the 64/128 is a little confusing, and deserves further explanation. Cartridge software is very popular in this country, and because the major control lines are supported on the cartridge port, manufactures have opted to put their comms software and interfacing electronics into one package – a cartridge. The Y2 Mustang software is one example, however, the cartridge in turn must be connected to a modem.

The next stage from this is to incorporate a modem into the package as well; examples are the Commodore modem and the Multi-modem from Miracle Technology.

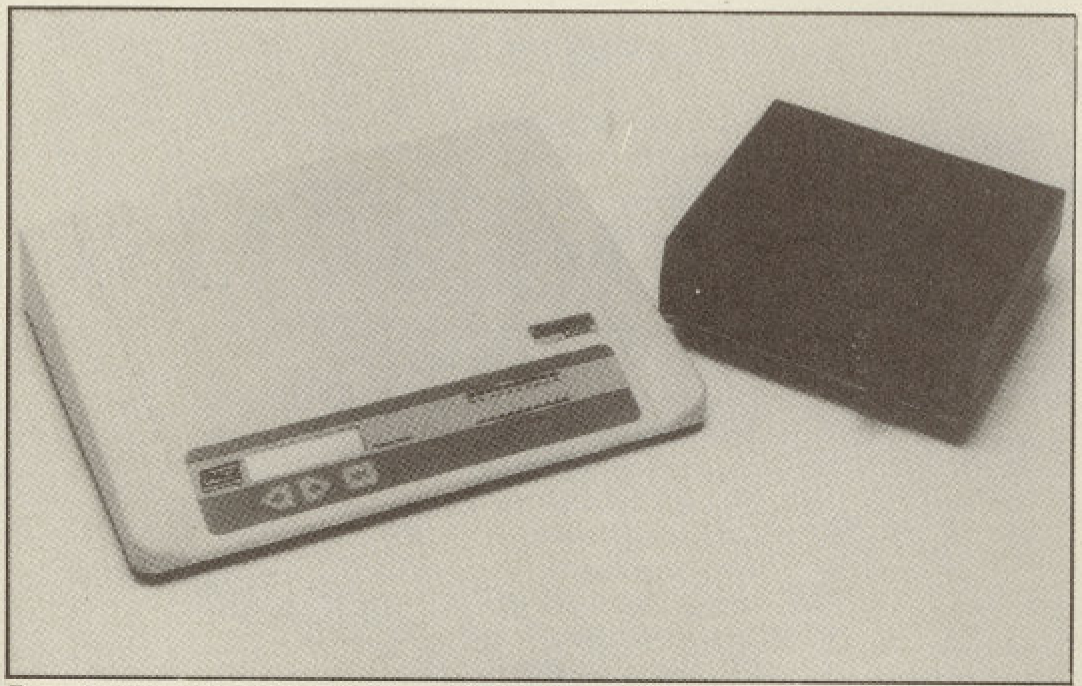
The alternative is to connect the modem to the 64/128 via the user port. To do this the user must purchase an RS232 interface (which costs as little as £30). Terminal software will be required to 'drive' the RS232 interface, but this should not be a problem as there are dozens of terminal programs in the public domain. One example is *Your Commodore's* very own Telecom 64, which was listed in the April 1986 issue. Connecting a modem via this method has the advantage that the RS232 interface can be used to drive devices other than a modem a printer or plotter for example. The main disadvantage is that there is no viewdata software (that I know of) which operates through the user port.

Enterprise 1

Probably the best way to describe the Enterprise 1 is to say that it's a Voyager 7 with bits added on. The appearance and functionality are almost identical, and perhaps this is not so surprising as both the Enterprise 1 and the Voyager 7 were manufactured by Kirk automation.

Appearance wise, the Enterpise 1 is housed in a black casing with green lettering on the front panel. A rotary switch on the right is used to select the required baud rate which can be one of 300/300 org/ans, 1200/1200 half-duplex, 1200/75, 75/1200 baud and test. A feature which is not on the Voyager 7 is the one/off line button which is used when dialing/answering manually. An interesting oddity is that pushing the button in will switch the modem offline and out online. The other way round would have been more logical in my opinion.

At the rear of the modem is the RS232 socket (female), phone socket, telephone lead and power cable. Of particular interest is the 21 pin RS232 connector. Looking inside the modem reveals that pins 1-6, 15, 17, 20, 22-23 and 25 are in use. Basically this means that connecting the Enterprise to your



Pace Series Fair 12003 (left) and Kirk Enterprise 1.

Commodore should be no problem as a variety of options are available. The phone socket is recessed and allows a telephone to be used in-line with the modem which saves you the expense of buying a splitter.

Using the Enterprise 1 proved to be simplicity itself, even though the manual is quite grotty. When used with software such as Mustang from Y2 Computing the auto-dial feature can be used. The Enterprise series uses boring old relay technology to auto-dial, which is quite loud in operation and not the most reliable method of getting a telephone to dial, but what can you expect for the price?

One aspect of the operation of Enterprise 1 that particularly annoyed me was the so-called auto-answer facility which, more often than not, did not work. I have had this problem with several Voyager 7's, and I can only conclude that the problem is inherent in the design of the modem.

Having said this, all other aspects of the modems operation were fine, and I would conclude that if you are looking for a cheap (but mostly reliable) modem with dual speed operation, it would be a good idea to shop around for an Enterprise 1.

Series Four Range

The Series Four range of modems from Pace Micro Technology consists of three models, and I looked at the 1200S, which is in the 'middle' of the range.

What you get for the price (and the price is quite a lot) is sophistication with simplicity. Let me explain. The Series Four is one of the new breed of intelligent modems. That is, a lot of the work that is normally done by the micro/RS232 interface/software is done by the modem itself. The modem has its own control program and central processing unit and is in effect a computer in its own right. Operation of the modem is done by sending it commands from the terminal software. These commands were developed by the Hayes company and are widely used throughout the industry.

The 1200S model reviewed can operate at 300/300, 1200/75, 75/1200 and 1200/1200 full-duplex. It features auto-dial, auto-answer, auto-baud rate detection/selection. Also included is a battery backed clock/calandar and the facility to store up to 64 phone numbers in its internal 'note@ad' memory which is battery packed. The 1200S also features a full RS232 port with inline phone socket as well as a Centronics printer port and 20 segment led display with line strength indicator and speed buffering.

The modem itself is quite flat but takes up a large footprint on our work surface. The front panel consists of an LCD display with two touch-sensitive buttons (that are used to manually select options) and the line status/line strength LEDs. At the rear of the modem is the power supply socket for the PSU which is a separate unit, the inline phone socket, the Centronics port and the only button on the whole machine; the reset switch.

Interfacing the 1200S to your Commodore is also very easy. However, because the modem is intelligent, it can be used with practically any comms software you care to name.

Simple Operation

Once connected to your micro the 1200S is easy to operate. Due to the way the modem is wired up to the micro the comms software (such as Mustang) will think that the modem is online and go into terminal mode after a few seconds. The reason for this is that the commands to operate the modem are entered from your keyboard while *in* terminal mode. To understand this better consider the following example: using the Mustang cartridge connected to the Series Four I would like to contact Telecom Gold at 1200 baud full-duplex. I would select the terminal mode and to online by pressing return (even though I was not online). At this stage I would be greeted with a blank screen, but by entering 'AT?' followed by RETURN the Series Four help

Table 1 – ENTERPRISE 1 RS232 PIN OUTS

Pin No.	Function	Circuits
1	-	Data Ground
2	BA	Transmit Data
3	BB	Receive Data
4	CA	RTS
5	CB	CTS
6	CC	DSR
15	DB	Transmit Baud Clock
17	DD	Receive Baud Clock
20	CD	DTR
22	CE	Ring Detect
23	-	Data Direction
25	-	Charger

screen would be displayed (Table 2). To enter Telecom Gold at 1200 full-duplex I would simply enter the following:

ATD 583 1200

The rest would be automatic with the modem dialing, detecting the answer, selecting the appropriate baud rate and so on. Even if my terminal software can only operate at 300/300 baud it is still possible to use services that operate at 1200 baud full-duplex because the Series Four has an internal memory buffer that keeps things in order. The final result is that the modem is very easy to use, and yet extremely powerful. Without a doubt, the Series Four is the Rolls-Royce among modems.

Touchline:

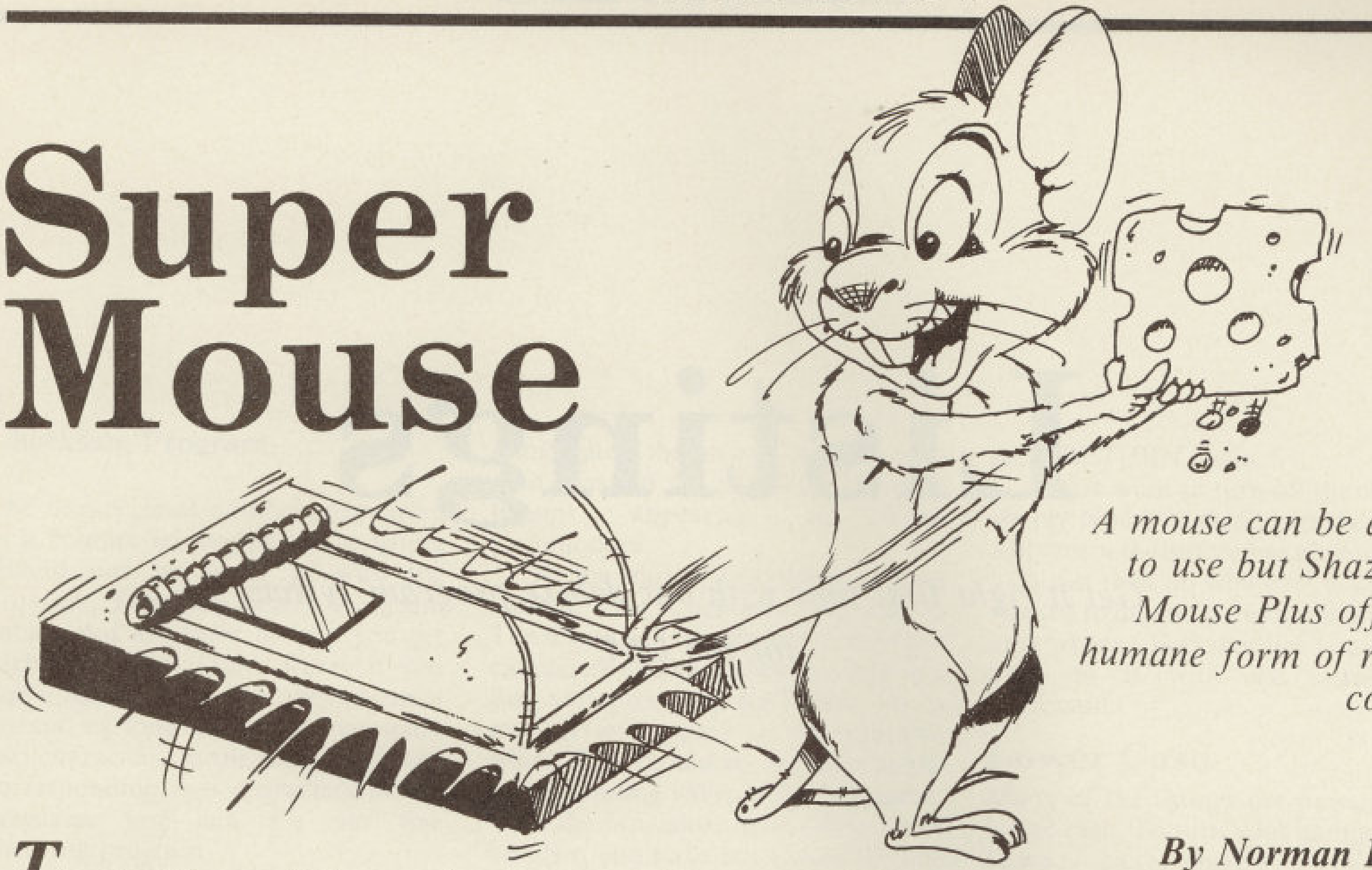
Product: *Kirk Enterprise 1.* ***Supplier:*** *Dataphone Ltd, 22 Alfrio Square, Woodston, Peterborough PE2 OJP.* ***Tel:*** *0733 23024.* ***Price:*** *£99.95.*

Product: *Pace Series Four 1200S.* ***Supplier:*** *Pace, 92 New Cross Street, Bradford BD5 8BS.* ***Tel:*** *0274 488211.* ***Price:*** *£399.*

TABLE 2 - SERIES FOUR

	AT Command Set
A :	Answer call without delay
C :	Carrier control C0=OFF, C1=ON
D :	Dial number and originate call
E :	Echo commands E0=OFF, E1=ON
F :	Echo data F0=ON, F1=OFF
H :	Hook control H0=ON, H1=OFF
I :	Display Identity In (n=0,1,2)
K :	Display/set time/date Kn (n=0,1,2)
L :	Speaker Loudness Ln (n=1,2,3)
M :	Monitor status Mn (n=0,1,2)
N :	Display/set number store
O :	Go back On-line
P :	Pulse dialling ON
Q :	Result codes Q0=ON, Q1=OFF
R :	Reverse to answer after dialling
S :	Display/set S registers
T :	Tone dialling On
U :	Unattended mode U0=OFF, U1=ON
V :	Result codes V0=Numeric, V1=English
W :	Wait for secondary dial tone
X :	Extended Result code (n=0,1,2,3,4)
Z :	Resets S Registers/commands

Super Mouse



A mouse can be a pest to use but Shazaan's Mouse Plus offers a humane form of rodent control

By Norman Doyle

The Neos Mouse and Cheese package forms part of the bait to lure prospective buyers into acquiring the Commodore 64C package. As with any mousetrap there is a catch – once the mouse is plugged in, the keyboard responds in a most peculiar way. In the real world mice are rarely noticed and it would be good if their electronic counterparts acted in a similar way.

With the Mouse Plus, Shazaan Systems offers a means of fulfilling this dream by providing a connector and associated software which allows the mouse to be attached to the user port instead of the joystick port. Connected in this way the software can then set up the necessary interrupts to allow the keyboard and mouse to be used in unison.

What's on the Disk

The disk provided with the adaptor/connector contains five programs which adequately demonstrate the power of the module. The first program offers an Amiga style set of pull-down menus, two of the others demonstrate the use of the mouse and a fourth is a program which can be incorporated in the user's own software.

The final program on the disk is a Cheese modifier which unfortunately only appears to work in conjunction with the disk version of the original program. The 64C package incorporates the cassette version of this mouse-driven drawing program. After transferring the cassette version to disk, I attempted to incorporate the modifier but found it to be a fruitless experiment. The Newcheese program generated would not operate at all so I would like to see a cassette modifier included in future.

To return to the Amiga-style menu program, the master menu names are displayed across the top line of the display screen. By clicking onto one of these headings various useful utility programs can be called from the revealed pull-down menus.

Disk commands such as errors and directory display, scratch, rename, initialise, validate, load (machine code or Basic) and save can be selected without the need to resort to the usual complex Basic commands. Clicking onto an option often results in an action window opening at the centre of the screen so that specific program details can be entered. When the operation has been completed, the original screen is restored.

The printer options gives a screen dump, Basic program printout and reset options. Utilities allows the recovery of a 'newed' program and the appending or merging of two programs. Border, screen, cursor or mouse pointer colours can be changed via the special menus option and the final menu simply displays the version date of the menu program in use.

The instructions give full details on how this rudimentary selection of utilities can be expanded with your own programs. This means that if a renumber utility is considered essential to your programming needs you can patch it into the menu system and then save the whole new program to disk.

Colour Change

One of the first utilities that I would like to add to this system is an option to change the colour of the menu tabs. These are displayed in dark blue so, if this is also your favoured background colour, the menu becomes invisible until you move the pointer onto one of the options.

The two mouse programs, Mouse1 and its associated demo, graphically display the way in which the system can be used to great effect in your own software and there is a separate program, Mouse2, which has been created for your own use.

The Mouse Plus package certainly offers vastly improved and much needed control systems for the Neos Mouse and turns a novelty into a practical device which will enhance your software. Such value does not come cheaply but for £19.95 you not only get the disk and the connector but also the freedom to leave your mouse permanently connected and ready for use with suitable software.

Touchline

Product: *The Mouse Plus.* ***Supplier:*** *Shazaan Systems, 8 Alm Close, Knap Hill, Woking, Surrey GU21 2BP.* ***Tel:*** *04867 89098.* ***Price:*** *£19.95.* ***Extras:*** *disk drive, Neos Mouse.*

Listings

Get it right first time with our deluxe program system for the C64.

You may have noticed that our listings are free of those horrible little black blobs which send you searching around the keyboard for a suitable graphic symbol. You may also have noticed the funny numbers by the side of each line of the listing. Fret no more, it's all part of our easy entry aid.

Instead of those nasty graphics and rows of countless spaces in PRINT statements and strings we use a special coding system. The code, or mnemonic, is always contained in square brackets and you'll soon learn to decipher their meanings.

For example, [SA] would mean type in a Shifted A, or an ace of spades in layman's terms, and [SA10] would mean a row of ten of these symbols.

[S+2] means hold down the shift key and press the plus key twice. It doesn't take a great leap of logic to realise that [C+2] means exactly the same thing except that the Commodore key (bottom left of the keyboard) is held down instead of the shift key.

If more than two spaces appear in a statement then this will be printed as [SPC4] or, exceptionally, [SSPC4]. Translated into English this means press the spacebar four times or in the latter case hold the shift key down while you do it.

A string of special characters could appear as:

[CTRL N, DOWN2,LEFT5,BLUE, F3,C3]

This would be achieved by holding down the CTRL key as you press N, press the cursor key down twice, the cursor left key five times, press the key marked BLUE while holding down the CTRL key, press the F3 key and, finally hold the Commodore key down while pressing the number two key (C2 would of course make the computer print in brown).

Always remember that you should only have a row of graphics characters on your screen with no square brackets and no commas, unless something like this appears:

[SS],[C*]

In this case the two characters should have a comma between them.

On rare occasions [REV T] will appear in a listing. This is a delete symbol and is created by entering the line up to this mnemonic. Then type a closing quotation mark (SHIFT & 2) and delete it. This gets the computer out of quotes mode. Hold down CTRL and press the number nine key (RVSON), type the relevant number of reversed T's and then hold down CTRL and press zero (RVSOFF). Next type another quotation mark and delete it again. Now finish the line and press RETURN.

A list of these special cases is given in the table but remember that only one of these mnemonics will appear outside of a PRINT string: the symbol for pi. This may appear when its value is needed in a calculation so this may look something like:

:CC=2*[PI]*R:

Ignore the square brackets and just type in a shifted upward pointing arrow (ie. the pi symbol).

PROGRAM: SYNTAX CHECKER

```
5 REM SYTAX CHECKER - ERIC DOYLE

10 BL=10   :LN=70   :SA=49152
20 FOR L=0 TO BL:CX=0:FOR D=0 TO
 15
30 READ A:IF A>255THENPRINT"NUMB
ER TO LARGE";LN+(L*10):STOP
40 CX=CX+A:POKE SA+L*16+D,A:NEXT
 D
50 READ A:IF A><CX THENPRINT"ERR
OR IN LINE";LN+(L*10):STOP
60 NEXT L:SYS 49152:NEW
70 DATA 173,5,3,201,165,208,31,1
20,169,9,141,32,208,141,33,208,1
847
80 DATA 169,7,141,134,2,169,13,3
2,210,255,169,64,141,4,3,169,168
2
90 DATA 192,141,5,3,88,96,120,16
9,124,141,4,3,169,165,141,5,1566

100 DATA 3,169,14,141,134,2,141,
32,208,169,6,141,33,208,88,96,15
85
110 DATA 32,124,165,72,138,72,15
2,72,162,0,165,20,133,254,165,21
,1747
120 DATA 24,101,254,133,254,189,
0,2,240,18,69,254,133,254,232,18
9,2346
130 DATA 0,2,240,8,24,101,254,13
3,254,232,208,233,169,1,141,134,
2134
140 DATA 2,165,254,74,74,74,74,3
2,156,192,32,210,255,165,254,41,
2054
150 DATA 15,32,156,192,32,210,25
5,169,13,32,210,255,169,13,32,21
0,1995
160 DATA 255,169,7,141,134,2,104
,168,104,170,104,96,24,105,48,20
1,1832
170 DATA 58,16,1,96,24,105,7,96,
0,0,0,0,0,0,0,0,403
```

by Eric Doyle

Checksum Program

The hexadecimal numbers appearing in a column to the left of the listing should not be typed in with the program. These are merely checksum values and are there to help you get each line right. Don't worry if you don't understand the hexadecimal system, as long as you can compare two characters on the screen with the corresponding two characters in the magazine you can use our line checking program.

Type in the Checksum Program, make sure that you've not made any mistakes and save it to tape or disk immediately because it will be used with most of the present and future listings appearing in Your Commodore.

At the start of each programming session, load Checksum and run it. The screen will turn brown with yellow characters and each time you type in a line and press the RETURN key a number will appear on the screen in white. This should be the same as the corresponding value in the magazine.

If the two values don't relate to one another, you have not copied the line exactly as printed so go back and check each character carefully. When you find the error simply correct it and press RETURN again.

If you want to turn off the checker simply type SYS49152 and the screen will return to the familiar blue colours. You can then do whatever it was you wanted to do and if this doesn't use the area where Checksum lies you can go back to it with the same SYS command.

Lower Case

Many of the listings are presented in lower case. To turn your computer to lower case mode press the Commodore key and the SHIFT key at the same time. YC

Mnemonic	Symbol	Keypress
[RIGHT]		CRSR left/right
[LEFT]		SHIFT & CRSR left/right
[DOWN]		CRSR up/down
[UP]		SHIFT & CRSR up/down
[F1]		f1 key
[F2]		SHIFT & f1 key
[F3]		f3 key
[F4]		SHIFT & f3 key
[F5]		f5 key
[F6]		SHIFT & f5 key
[F7]		f7 key
[F8]		SHIFT & f7 key
[HOME]		CLR/HOME
[CLR]		SHIFT & CLR/HOME
[RVSON]		CTRL & 9
[RVSOFF]		CTRL & 0

Mnemonic	Symbol	Keypress
[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8
[POUND]		£
[LARROW]		←
[UPARROW]		↑
[PI]		SHIFT & ↑
[INST]		SHIFT & INST/DEL
[REV T]		see text
[Cletter]		CBM + letter
[Sletter]		SHIFT + letter

Listings

Multi Dump

Program 1

```
10 REM MULTI-DUMP M/C LOADER
20 REM D.G.WILKINSON 1987
30 BL=37   :LN=90   :SA=52640
40 FOR L=0 TO BL:CX=0:FOR D=0 TO 15
50 READ A:IF A>255THENPRINT"NUMBER[sp]TO[sp]LARGE";LN+(L*10):STOP
60 CX=CX+A:POKE SA+L*16+D,A:NEXT D
70 READ A:IF A><CX THENPRINT"ERROR[sp]IN[sp]LINE";LN+(L*10):STOP
80 NEXT L:END
90 DATA 0,0,0,0,0,0,195,68,71,87,49,57,56,55,27,51,716
100 DATA 23,27,42,1,192,3,120,169,193,141,20,3,169,207,141,21,1472
110 DATA 3,88,96,27,51,23,27,42,4,64,1,32,239,205,169,25,1096
120 DATA 141,129,206,173,255,207,240,8,32,39,206,76,227,205,27,50,2221
130 DATA 32,67,206,206,129,206,208,235,32,115,206,76,199,207,173,169,2466
140 DATA 255,141,3,221,173,213,206,240,14,173,253,207,133,254,173,38,2697
150 DATA 206,133,255,76,17,206,20,173,254,207,133,254,173,66,206,133,2512
160 DATA 255,169,128,141,156,206,173,255,207,208,5,169,192,141,156,206,2767
170 DATA 169,13,32,165,207,96,4,169,7,141,91,207,169,0,141,132,1743
180 DATA 207,174,6,206,240,8,169,32,32,165,207,202,208,248,32,157,2293
190 DATA 206,96,32,165,254,141,51,207,165,255,141,71,207,169,3,141,2304
200 DATA 91,207,169,0,141,132,207,32,157,206,173,51,207,133,254,173,2333
210 DATA 71,207,133,255,169,7,141,91,207,169,4,141,132,207,32,157,2123
220 DATA 206,96,208,162,0,189,222,205,32,165,207,232,224,2,208,245,2603
230 DATA 96,173,162,0,173,255,207,208,7,189,174,205,76,147,206,173,2451
240 DATA 189,195,205,32,165,207,232,224,8,208,233,96,173,169,40,141,2517
250 DATA 143,206,32,130,206,173,213,206,240,3,32,214,206,32,3,207,2246
260 DATA 32,133,207,24,173,213,206,208,2,169,8,101,254,133,254,165,2282
270 DATA 255,105,0,133,255,206,143,206,208,219,169,13,32,165,207,169,2485
280 DATA 10,32,165,207,96,173,160,0,177,254,133,252,132,253,24,6,2074
290 DATA 252,38,253,6,252,38,253,6,252,38,253,24,165,253,109,114,2306
300 DATA 206,133,253,173,24,208,41,2,240,7,165,253,24,105,8,133,1975
310 DATA 253,96,173,172,91,207,140,164,207,162,0,169,0,157,166,205,2362
320 DATA 232,224,8,208,248,173,213,206,240,7,32,52,207,76,36,207,2369
330 DATA 173,32,72,207,32,92,207,206,164,207,172,164,207,204,132,207,2478
340 DATA 16,227,96,173,165,1,141,32,207,41,251,133,1,177,252,72,1985
350 DATA 173,32,207,133,1,104,96,173,165,1,141,32,207,37,252,133,1887
360 DATA 1,177,254,72,173,32,207,133,1,104,96,173,162,0,10,72,1667
370 DATA 160,0,144,3,172,156,206,152,29,166,205,172,164,207,204,132,2272
380 DATA 207,240,7,172,255,207,208,1,74,74,157,166,205,104,232,224,2533
390 DATA 8,144,219,96,173,162,0,189,166,205,32,165,207,173,255,207,2401
400 DATA 208,12,189,166,205,32,165,207,189,166,205,32,165,207,232,224,2604
410 DATA 8,144,228,96,173,141,1,221,173,0,221,41,251,141,0,221,2060
420 DATA 169,16,44,13,221,240,251,173,0,221,9,4,141,0,221,96,1819
430 DATA 173,165,197,201,64,208,4,76,49,234,173,201,4,208,7,160,2124
440 DATA 1,162,0,240,31,173,201,5,208,7,160,0,162,0,240,20,1610
450 DATA 173,201,6,208,7,160,1,162,1,208,9,173,201,3,208,215,1936
460 DATA 160,0,162,1,140,255,207,142,213,206,76,203,205,0,0,0,1970
```

Program 2

```
10 REM MULTIDUMP BY D.G.WILKINSON
20 REM COPYRIGHT OCTOBER 1987
40 POKE53280,2:POKE53281,5
50 PRINT"[cl,dn,ct1,sp*13,r+]MULTI-DUMP"
60 PRINT"[ct1,sp*6]PRINTS[sp]HIRES[sp]&[sp]CHAR[sp]SCREENS"
70 PRINT"[sp*7]ON[sp]CANON[sp]&[sp]EPSON[sp]PRINTERS"
80 PRINT"[sp*4]USING[sp]PARALLEL[sp]I/F[sp]IN[sp]USER[sp]PORT"
90 PRINT"[sp*4]COPYRIGHT[sp]D.G.WILKINSON[sp]OCT[sp]1987"
130 Z2=32
140 PRINT"[dn]HIRES[sp]SCREEN[sp]ADDR=8192($2000)[sp]OK?[sp]Y/N[sp]";
150 GOSUB 720
```

```
160 IF YN=1GOTO0190
170 GOSUB770
180 IFYN=1GOTO0170
190 POKE52802,Z2
200 Z2=4
210 PRINT"[dn]CHAR[sp]SCREEN[sp]ADDR=1024($0400)[sp]OK?[sp]Y/N[sp]";
220 GOSUB720
230 IFYN=1GOTO0260
240 GOSUB770
250 IF YN=1GOTO0240
260 POKE52774,Z2
270 Z2=208:Z3=251
280 PRINT"[dn]STANDARD[sp]CHAR.[sp]SET[sp]OK?[sp]Y/N[sp]";
290 GOSUB720
300 IFYN=1GOTO0370
310 Z3=252
320 PRINT"[dn]CHAR[sp]RAM[sp]ADDR=53248($D000)[sp]OK?[sp]Y/N[sp]";
330 GOSUB720
340 IFYN=1GOTO0370
350 GOSUB770
360 IFYN=1GOTO0350
370 POKE52850,Z2:POKE53050,Z3
380 N1=20
390 PRINT"[dn]SPACES[sp]BEFORE[sp]START[sp]OF[sp]SMALL"
400 PRINT"[sp]PICTURE[sp]=[sp]20[sp*2]OK?[sp]Y/N[sp]";
410 GOSUB720
420 IFYN=1GOTO0460
430 PRINT"GIVE[sp]NO.[sp]OF[sp]SPACES[sp](0-40)[sp]";
440 GOSUB1070
450 IF YN=1 OR N1<0 OR N1>40 THENPRINT"[ctE,sp*2]BAD[sp]INPUT[sp]TRY[sp]AGAIN![ct1]":GOTO0430
460 POKE52742,N1
470 N1=23
480 PRINT"[dn]NARROW[sp]LINE[sp]FEED[sp]OK?[sp]Y/N[sp]";
490 GOSUB720
500 IFYN=1GOTO0530
510 PRINT"PAPER[sp]FEED[sp]NOW[sp]SET[sp]TO[sp]24/216"
520 N1=24
530 POKE52656,N1:POKE52677,N1
540 N1=169
550 PRINT"[dn]LINE[sp]FEED[sp]REQUIRED?[sp]Y/N[sp]";
560 GOSUB720
570 IFYN=1GOTO0590
580 N1=96
590 POKE52943,N1
600 SYS52662
610 PRINT"[cl,dn,ct1,sp*13,r+]MULTI-DUMP"
620 PRINT"[dn,sp*7]MULTI-DUMP[sp]NOW[sp]ACTIVATED"
630 PRINT"[dn*2,sp*3]PRESS:"
640 PRINT"[dn,sp*3]KEY[sp]F1[sp]FOR[sp]SMALL[sp]HI-RES[sp]PRINT"
650 PRINT"[dn,sp*3]KEY[sp]F3[sp]FOR[sp]LARGE[sp]HI-RES[sp]PRINT"
660 PRINT"[dn,sp*3]KEY[sp]F5[sp]FOR[sp]SMALL[sp]CHAR[sp]SCREEN[sp]PRINT"
670 PRINT"[dn,sp*3]KEY[sp]F7[sp]FOR[sp]LARGE[sp]CHAR[sp]SCREEN[sp]PRINT"
680 PRINT"[dn*2]NOTE:[sp]IT[sp]MAY[sp]BE[sp]NECESSARY[sp]TO[sp]TOGGLE"
690 PRINT"[sp*6]THE[sp]PRINTER[sp]'ON-LINE'[sp]SWITCH"
700 PRINT"[sp*6]TO[sp]START[sp]PRINTING."
710 END
720 YN=0
730 GETA$:IF A$=""GOTO0720
740 IF A$="Y"THENYN=1:PRINT"[ct8]Y[ct1]":RETURN
750 IF A$<>"N"GOTO0730
760 PRINT"[ct8]N[ct1]":RETURN
770 YN=0
780 PRINT"[ct1,sp]GIVE[sp]NEW[sp]ADDRESS[sp]-[sp,ct7]";:Z$=""
790 GET A$:IF A$="" GOTO 790
800 IF A$=CHR$(13) GOTO 820
810 PRINTA$;:Z$=Z$+A$:GOTO0790
820 PRINT"[ct1]"
830 IF LEFT$(Z$,1)="$" THEN GOSUB 940:RETURN
840 IF YN<>2 GOTO0870
```

```
850 PRINT"[ct8,sp*2]BAD[sp]HEX[sp]NUMBER[sp]-[sp]TRY[sp]AGAIN"
860 GOTO900
870 Z1=VAL(Z$)
880 IF Z1<65535GOTO910
890 PRINT"[ctE]TOO[sp]BIG,[sp]TRY[sp]AGAIN[ct1]"
900 YN=1:RETURN
910 Z2=INT(Z1/256)
920 Z3=Z1-Z2*256
930 RETURN
940 Z$=RIGHT$(Z$,LEN(Z$)-1)
950 IF LEN(Z$)>4 THEN YN=2:RETURN
960 Z2=0:Z3=0
970 FORI=4TO1STEP-1
980 Z1=ASC(MID$(Z$,I,1))-48
990 IF Z1<0 OR Z1>22 THENYN=2:GOTO 1050
1000 IF Z1>9 THEN Z1=Z1-7
1010 IF I=4THENZ3=Z1
1020 IF I=3THENZ3=Z3+16*Z1
1030 IF I=2THENZ2=Z1
1040 IF I=1THENZ2=Z2+16*Z1
1050 NEXTI
1060 RETURN
1070 A$="":YN=0
1080 GETZ$:IFZ$=""GOTO1080
1090 IFZ$=CHR$(13)GOTO1120
1100 PRINT"[ct8]"Z$;
1110 A$=A$+Z$:GOTO1080
1120 PRINT"[ct1]":IFLEN(A$)=0THENYN=1:RETURN
1130 N1=VAL(A$):RETURN
```

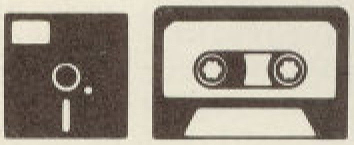
Music While You Load

Getting it all in

The program is presented here as a simple Basic loader. Type it in using our SYNTAX CHECKER, see LISTINGS.

When RUN the program will POKE the machine code for MUSILOAD into memory and enter the editor.
You can then generate your own music and save it to tape or disk

NB. Instructions for entering the program have been modified since the text for this item was produced. Ignore the entry instructions in the article.



PROGRAM: MUSILOAD

```
9C  0 CLR
D5  1 DIMA$(100),A(100)
24  3 PRINT"[CLR]PLEASE WAIT.
24  5 LN=90:RESTORE
CD  10 FORI=49152TO49892STEP10
11  15 LN=LN+10:C=0
2A  20 FORJ=ITOI+9
BF  30 READA:C=C+A
66  40 POKEJ,A
06  50 NEXTJ:READA
99  60 IFA<>CTHENPRINT"ERROR IN
    LINE ";LN:END
0D  70 NEXTI
58  80 GOTO1200
1E  100 DATA 120, 169, 112, 141,
     40, 3, 169, 192, 141, 41, 1
    128
5A  110 DATA 3, 169, 0, 133, 251
    , 169, 195, 133, 252, 169, 1
    474
5B  120 DATA 80, 133, 253, 169,
    0, 162, 0, 157, 0, 212, 1166
44  130 DATA 232, 224, 24, 208,
    248, 169, 15, 141, 24, 212,
    1497
9E  140 DATA 169, 9, 141, 5, 212
    , 141, 12, 212, 141, 19, 106
    1
DF  150 DATA 212, 169, 1, 141, 2
    36, 194, 141, 237, 194, 141,
     1666
08  160 DATA 238, 194, 141, 239,
     194, 141, 240, 194, 141, 24
    1, 1963
F8  170 DATA 194, 141, 242, 194,
     141, 243, 194, 141, 244, 19
    4, 1928
DC  180 DATA 141, 245, 194, 141,
     246, 194, 141, 247, 194, 16
    9, 1912
C2  190 DATA 128, 141, 6, 212, 1
    41, 13, 212, 141, 20, 212, 1
    226
B2  200 DATA 169, 255, 141, 248,
     194, 169, 15, 141, 244, 194
    , 1770
81  210 DATA 88, 96, 72, 138, 72
    , 152, 72, 32, 27, 193, 942
F2  220 DATA 206, 248, 194, 173,
     248, 194, 201, 0, 240, 8, 1
    712
E8  230 DATA 104, 168, 104, 170,
     104, 76, 237, 246, 169, 30,
     1408
1B  240 DATA 141, 248, 194, 206,
     250, 194, 173, 250, 194, 20
    1, 2051
E3  250 DATA 0, 240, 8, 104, 168
    , 104, 170, 104, 76, 237, 12
    11
0B  260 DATA 246, 164, 253, 177,
     251, 141, 0, 212, 32, 251,
    1727
A0  270 DATA 192, 177, 251, 141,
     1, 212, 32, 251, 192, 177,
    1626
3D  280 DATA 251, 141, 7, 212, 3
    2, 251, 192, 177, 251, 141,
    1655
FF  290 DATA 8, 212, 32, 251, 19
    2, 177, 251, 141, 14, 212, 1
    490
AD  300 DATA 32, 251, 192, 177,
    251, 141, 15, 212, 32, 251,
    1554
83  310 DATA 192, 177, 251, 141,
     250, 194, 32, 251, 192, 169
    , 1849
5C  320 DATA 0, 141, 4, 212, 141
    , 11, 212, 141, 18, 212, 109
    2
92  330 DATA 169, 33, 141, 4, 21
    2, 141, 11, 212, 141, 18, 10
    82
04  340 DATA 212, 132, 253, 104,
     168, 104, 170, 104, 76, 237
    , 1560
CB  350 DATA 246, 200, 204, 251,
     194, 208, 18, 165, 252, 205
    , 1943
9A  360 DATA 252, 194, 208, 11,
    169, 195, 133, 252, 169, 80,
     1663
D2  370 DATA 133, 253, 160, 80,
    96, 192, 0, 240, 1, 96, 1251
7F  380 DATA 230, 252, 96, 173,
    0, 220, 201, 127, 208, 3, 15
```

```
    10
B7  390 DATA 76, 92, 194, 201, 1
    11, 240, 50, 201, 126, 240,
    1531
92  400 DATA 88, 201, 123, 240,
    100, 201, 119, 208, 3, 76, 1
    359
F0  410 DATA 202, 193, 201, 125,
     240, 81, 201, 107, 208, 3,
    1561
26  420 DATA 76, 252, 193, 201,
    103, 208, 3, 76, 20, 194, 13
    26
E5  430 DATA 201, 110, 208, 3, 7
    6, 44, 194, 201, 109, 208, 1
    354
7D  440 DATA 3, 76, 68, 194, 76,
     92, 194, 206, 236, 194, 133
    9
8A  450 DATA 173, 236, 194, 201,
     0, 240, 3, 76, 92, 194, 140
    9
00  460 DATA 169, 255, 141, 236,
     194, 206, 237, 194, 173, 23
    7, 2042
DD  470 DATA 194, 201, 0, 240, 3
    , 76, 92, 194, 169, 10, 1179
C5  480 DATA 141, 237, 194, 238,
    32, 208, 76, 92, 194, 169,
    1581
BB  490 DATA 1, 141, 238, 194, 7
    6, 92, 194, 169, 0, 141, 124
    6
56  500 DATA 238, 194, 76, 92, 1
    94, 206, 239, 194, 173, 239,
     1845
65  510 DATA 194, 201, 0, 240, 3
    , 76, 92, 194, 169, 255, 142
    4
E9  520 DATA 141, 239, 194, 206,
     242, 194, 173, 242, 194, 20
    1, 2026
44  530 DATA 0, 240, 3, 76, 92,
    194, 169, 10, 141, 242, 1167
93  540 DATA 194, 169, 255, 141,
     239, 194, 206, 244, 194, 17
    3, 2009
38  550 DATA 244, 194, 141, 24,
    212, 76, 92, 194, 206, 240,
    1623
37  560 DATA 194, 173, 240, 194,
    201, 0, 240, 3, 76, 92, 141
    3
54  570 DATA 194, 169, 255, 141,
     240, 194, 206, 243, 194, 17
    3, 2009
D6  580 DATA 243, 194, 201, 0, 2
    08, 118, 169, 10, 141, 243,
    1527
B7  590 DATA 194, 169, 255, 141,
     240, 194, 238, 244, 194, 17
    3, 2042
46  600 DATA 244, 194, 141, 24,
    212, 76, 92, 194, 206, 253,
    1636
2D  610 DATA 194, 173, 253, 194,
     201, 0, 240, 3, 76, 92, 142
    6
52  620 DATA 194, 169, 255, 141,
     253, 194, 206, 139, 192, 76
    , 1819
DE  630 DATA 92, 194, 206, 254,
    194, 173, 254, 194, 201, 0,
    1762
15  640 DATA 240, 3, 76, 92, 194
    , 169, 255, 141, 254, 194, 1
    618
5A  650 DATA 238, 139, 192, 76,
    92, 194, 206, 255, 194, 173,
     1759
3E  660 DATA 255, 194, 201, 0, 2
    08, 38, 169, 255, 141, 255,
    1716
C3  670 DATA 194, 206, 105, 193,
     206, 112, 194, 76, 92, 194,
     1572
FD  680 DATA 206, 0, 195, 173, 0
    , 195, 201, 0, 208, 14, 1192
E4  690 DATA 169, 255, 141, 0, 1
    95, 238, 105, 193, 238, 112,
     1646
0D  700 DATA 194, 76, 92, 194, 1
    73, 238, 194, 201, 1, 240, 1
    603
55  710 DATA 1, 96, 206, 246, 19
    4, 173, 246, 194, 201, 0, 15
    57
E8  720 DATA 240, 1, 96, 169, 25
    5, 141, 246, 194, 206, 247,
    1795
1C  730 DATA 194, 173, 247, 194,
     201, 0, 240, 1, 96, 169, 15
    15
D5  740 DATA 10, 141, 247, 194,
    238, 32, 208, 96, 169, 237,
    1572
13  750 DATA 141, 40, 3, 169, 24
    6, 141, 41, 3, 169, 0, 953
F1  760 DATA 162, 0, 157, 0, 212
    , 232, 224, 25, 208, 248, 14
    68
CE  770 DATA 96, 40, 0, 255, 0,
    255, 0, 255, 8, 72, 981
7D  780 DATA 8, 255, 0, 255, 137
    , 255, 0, 183, 0, 255, 1348
3F  790 DATA 0, 181, 0, 255, 10,
     72, 0, 255, 0, 189, 962
67  800 DATA 8, 255, 8, 255, 0,
    255, 0, 255, 0, 255, 1291
37  810 DATA 0, 255, 0, 255, 0,
    0, 0, 255, 0, 8, 773
39  820 DATA 0, 255, 0, 255, 0,
    255, 0, 255, 0, 255, 1275
6F  830 DATA 0, 255, 0, 255, 0,
    16, 0, 255, 0, 255, 1036
67  840 DATA 0, 48, 0, 255, 0, 2
    55, 0, 8, 1, 1, 568
8C  1000 REM  HF LF NOTE
67  1010 DATAC0,268,C#0,284,D0,3
    01,D#0,318,E0,337,F0,358,F#0
    ,379,G0,401,G#0,425
1C  1020 DATAA0,451,A#0,477,B0,5
    06,C1,536,C#1,568,D1,602,D#1
    ,637,E1,675,F1,716
CE  1030 DATAF#1,758,G1,803,G#1,
    851,A1,902,A#1,955,B1,1012,C
    2,1072,C#2,1136,D2,1204
3B  1040 DATAD#2,1275,E2,1351,F2
    ,1432,F#2,1517,G2,1607,G#2,1
    703,A2,1804,A#2,1911
3C  1050 DATAB2,2025,C3,2145,C#3
    ,2273,D3,2408,D#3,2551,E3,27
    03,F3,2864,F#3,3034
EF  1060 DATAG3,3215,G#3,3406,A3
    ,3608,A#3,3823,B3,4050,C4,42
    91,C#4,4547,D4,4817
A1  1070 DATAD#4,5103,E4,5407,F4
    ,5728,F#4,6069,G4,6430,G#4,6
    812,A4,7217,A#4,7647
F6  1080 DATAB4,8101,C5,8583,C#5
    ,9094,D5,9634,D#5,10207,E5,1
    0814,F5,11457,F#5,12139
05  1090 DATAG5,12860,G#5,13625,
    A5,14435,A#5,15294,B5,16203,
    C6,17167,C#6,18188
E6  1100 DATAD6,19269,D#6,20415,
    E6,21629,F6,22915,F#6,24278,
    G6,25721,G#6,27251
73  1110 DATAA6,28871,A#6,30588,
    B6,32407,C7,34334,C#7,36376,
    D7,38539,D#7,40830
04  1120 DATAE7,43258,F7,45830,F
    #7,48556,G7,51443,G#7,54502,
    A7,57743,A#7,61176
FB  1130 DATAB7,64814
A2  1200 GOSUB6030
31  1201 INPUT"[CLR]DO YOU WANT
     A PRESET TUNE OR THE MUSIC
     EDITOR [RVSON]P[RVSOFF] OR [
    RVSON]E[RVSOFF] ";Q$
39  1202 IFQ$="E"THEN10000
A4  1203 IFQ$<>"P"THEN1201
BB  1204 PRINT"[CLR]HANG ON A SE
    C."
BC  1209 FORI=1TO96:READA$(I),A(
    I):NEXT
1C  1210 I=50000
C6  1220 READA$,B$,C$,DU
22  1225 IFA$="-1"THENPRINT"FINI
    SHED.":GOTO6000
CB  1230 FORJ=1TO96
72  1240 IFA$=A$(J)THENA=A(J):GO
    TO1260
AE  1250 NEXTJ
10  1255 PRINTA$;" IS INVALID IN
     NOTE";(I-50000)/7+1:END
E1  1260 FORJ=1TO96
7F  1270 IFB$=A$(J)THENB=A(J):GO
    TO1290
D1  1280 NEXTJ
5E  1285 PRINTB$;" IS INVALID IN
     NOTE";(I-50000)/7+1:END
4E  1290 FORJ=1TO96
88  1300 IFC$=A$(J)THENC=A(J):GO
    TO1320
EB  1310 NEXTJ
7F  1315 PRINTC$;" IS INVALID IN
     NOTE";(I-50000)/7+1:END
D6  1320 A1=INT(A/256):B1=A-A1*2
    56
F5  1330 A2=INT(B/256):B2=B-A2*2
    56
C4  1340 A3=INT(C/256):B3=C-A3*2
    56
53  1350 IFDU>255ORDU<0THENPRINT
    "DURATION";DU;"IS INVALID IN
     NOTE";(I-50000)/7+1:END
D5  1370 POKEI,B1:I=I+1
F2  1380 POKEI,A1:I=I+1
B6  1390 POKEI,B2:I=I+1
D9  1400 POKEI,A2:I=I+1
BB  1410 POKEI,B3:I=I+1
9C  1420 POKEI,A3:I=I+1
24  1425 POKEI,DU:I=I+1
30  1430 IFI>53200THENPRINT"[CLR
    ]FULL FULL FULL FULL FULL FU
    LL FULL FULL":GOTO6000
91  1440 GOTO1220
38  2000 DATAF1,F1,F1,25
02  2010 DATAC2,C2,C2,25
5C  2020 DATAF1,F1,F1,25
CE  2030 DATAC2,C2,C2,25
70  2040 DATAF1,F1,F1,25
FB  2050 DATAC2,C2,C2,25
6B  2060 DATAF1,F1,F1,25
87  2070 DATAC2,C2,C2,25
37  2080 DATAF1,A2,F1,12
EE  2090 DATAF1,A#2,F1,12
60  2100 DATAC2,C3,C2,12
BD  2110 DATAC2,D3,C2,12
30  2120 DATAF1,C3,F1,25
27  2130 DATAC2,A2,F3,25
DD  2140 DATAF1,A2,F3,25
73  2150 DATAC2,C3,G3,25
84  2160 DATAF1,F3,A3,25
7B  2170 DATAC2,F2,A3,25
73  2180 DATAF1,A2,F1,12
32  2190 DATAF1,A#2,F1,12
9B  2200 DATAC2,C3,C1,12
8E  2210 DATAC2,D3,C1,12
0C  2220 DATAF1,C3,F1,25
E3  2230 DATAC2,A2,F3,25
59  2240 DATAF1,A2,F3,25
03  2250 DATAC2,A#2,E3,25
65  2260 DATAF1,A2,F3,25
5B  2270 DATAC2.A2,F3,25
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EF   2280 DATAF1,A2,F1,12
A6   2290 DATAF1,A#2,F1,12
F7   2300 DATAC2,C3,C1,12
4A   2310 DATAC2,D3,C2,12
41   2320 DATAF1,C3,F1,25
8A   2330 DATAC2,A2,F3,25
96   2340 DATAF1,A2,F3,25
B2   2350 DATAC2,C3,G3,25
BB   2360 DATAF1,F3,A3,25
BC   2370 DATAC2,F2,A3,25
2A   2380 DATAF1,A2,F1,12
05   2390 DATAF1,A#2,F1,12
D8   2400 DATAC2,C3,C1,12
11   2410 DATAC2,D3,C1,12
7D   2420 DATAF1,C3,F1,25
06   2430 DATAC2,A2,F3,25
92   2440 DATAF1,A2,F3,25
C8   2450 DATAC2,A#2,E3,25
9E   2460 DATAF1,A2,F3,25
9E   2470 DATAC2,A2,F3,25
21   2480 DATAC1,C1,C1,25
B0   2490 DATAC2,E3,G3,25
AD   2500 DATAC1,C1,C1,25
AA   2510 DATAC2,F3,G#3,25
59   2520 DATAC1,C1,C1,25
E4   2530 DATAC2,F#3,A3,25
C5   2540 DATAC1,C1,C1,25
FB   2550 DATAC2,G3,A#3,25
1F   2560 DATAC1,A#3,D4,25
02   2570 DATAC2,A3,C4,25
9F   2580 DATAC1,G3,A#3,25
70   2590 DATAC2,F3,A3,25
B4   2600 DATAC1,E3,G3,25
C3   2610 DATAC2,F3,B3,25
45   2620 DATAC1,E3,C4,25
2D   2630 DATAC2,C2,C2,25
2A   2640 DATAC1,C1,C1,25
DF   2650 DATAC2,E3,G3,25
F6   2660 DATAC1,C1,C1,25
3D   2670 DATAC2,F3,G#3,25
22   2680 DATAC1,C1,C1,25
B1   2690 DATAC2,F#3,A3,25
EE   2700 DATAC1,C1,C1,25
48   2710 DATAC2,G3,A#3,25
BF   2720 DATAC1,A#3,D4,25
22   2730 DATAC2,A3,C4,25
7F   2740 DATAC1,G3,A#3,25
90   2750 DATAC2,F3,A3,25
54   2760 DATAC1,E3,G3,25
CC   2770 DATAC1,C3,G3,25
5C   2780 DATAB2,B2,B2,25
FA   2790 DATAA#2,A#2,A#2,25
C5   2800 DATAF1,A2,F1,12
10   2810 DATAF1,A#2,F1,12
F5   2820 DATAC2,C3,C2,12
A0   2830 DATAC2,D3,C2,12
27   2840 DATAF1,C3,F1,25
B4   2850 DATAC2,A2,F3,25
8C   2860 DATAF1,A2,F3,25
48   2870 DATAC2,C3,G3,25
0D   2880 DATAF1,F3,A3,25
D2   2890 DATAC2,F2,A3,25
00   2900 DATAF1,A2,F1,12
CF   2910 DATAF1,A#2,F1,12
6E   2920 DATAC2,C3,C1,12
E3   2930 DATAC2,D3,C1,12
23   2940 DATAF1,C3,F1,25
F0   2950 DATAC2,A2,F3,25
E8   2960 DATAF1,A2,F3,25
BE   2970 DATAC2,A#2,E3,25
34   2980 DATAF1,A2,F3,25
08   2990 DATAC2,A2,F3,25
3C   3000 DATAF1,A2,F1,12
53   3010 DATAF1,A#2,F1,12
AD   3020 DATAC2,C3,C2,12
58   3030 DATAC2,D3,C2,12
5F   3040 DATAF1,C3,F1,25
CC   3050 DATAC2,A2,F3,25
A4   3060 DATAF1,A2,F3,25
00   3070 DATAC2,C3,G3,25
00   3080 DATAF1,F3,A3,25
87   3090 DATAC2,F2,A3,25
37   3100 DATAF1,A2,F1,12
EE   3110 DATAF1,A#2,F1,12
5F   3120 DATAC2,C3,C1,12
BA   3130 DATAC2,D3,C1,12
30   3140 DATAF1,C3,F1,25
27   3150 DATAC2,A2,F3,25
DD   3160 DATAF1,A2,F3,25
F7   3170 DATAC2,A#2,E3,25
E9   3180 DATAF1,A2,F3,25
7F   3190 DATAC2,A2,F3,25
EB   3200 DATAC3,D#3,F3,25
CD   3210 DATAC3,D#3,F3,25
BF   3220 DATAC3,D#3,F3,25
C0   3230 DATAA2,D#3,F3,12
41   3240 DATAF2,D#3,F3,12
65   3250 DATAC3,D#3,F3,25
D1   3260 DATAD#3,D#3,F3,25
B7   3270 DATAD#3,D#3,F3,25
A5   3280 DATAD#3,D#3,F3,25
DA   3290 DATAA#2,D3,F3,25
64   3300 DATAA#2,D3,F3,25
7E   3310 DATAA#2,D3,F3,25
FB   3320 DATAA2,D3,F3,12
12   3330 DATAG2,D3,F3,12
87   3340 DATAF2,D3,F3,25
1E   3350 DATAD3,D3,F3,25
38   3360 DATAD3,D3,F3,25
B2   3370 DATAD3,D3,F3,25
44   3380 DATAC3,D#3,F3,25
66   3390 DATAC3,D#3,F3,25
88   3400 DATAC3,D#3,F3,25
61   3410 DATAA2,D#3,F3,12
16   3420 DATAF2,D#3,F3,12
1E   3430 DATAC3,D#3,F3,25
06   3440 DATAD#3,D#3,F3,25
EC   3450 DATAD#3,D#3,F3,25
7A   3460 DATAD#3,D#3,F3,25
D3   3470 DATAA#2,D3,F3,25
05   3480 DATAA#2,D3,F3,25
13   3490 DATAA#2,D3,F3,12
0A   3500 DATAA2,D3,F3,12
FF   3510 DATAA#2,D3,F3,12
AC   3520 DATAG2,D3,F3,12
35   3530 DATAF2,D3,F3,25
5C   3540 DATAD3,D3,F3,25
A2   3550 DATAF3,F3,G#3,25
A4   3560 DATAF3,F3,G#3,25
67   3570 DATAD3,F3,G3,25
55   3580 DATAD3,F3,G3,25
12   3590 DATAD3,F3,G3,25
85   3600 DATAB2,F3,G3,12
38   3610 DATAG2,F3,G3,12
EE   3620 DATAC3,D#3,G3,25
08   3630 DATAD#3,D#3,G3,25
AE   3640 DATAD#3,D#3,G3,25
3C   3650 DATAD#3,D#3,G3,25
61   3660 DATAC3,D#3,F3,25
73   3670 DATAC3,D#3,F3,25
35   3680 DATAC3,D#3,F3,25
0A   3690 DATAA2,D#3,F3,12
9B   3700 DATAF2,D#3,F3,12
B4   3710 DATAD3,F3,A#2,25
EF   3720 DATAD3,D3,F3,25
41   3730 DATAD3,D3,F3,25
93   3740 DATAD3,D3,F3,25
B5   5999 DATA-1,-1,-1,-1
3F   6000 A=INT(I/256):B=I-A*256
D4   6010 PRINTA,B,I
B9   6020 POKE49916,A:POKE49915,B
46   6021 PRINT"[CLR]DO YOU WANT
     TO SAVE THE PROGRAM AS A M/C
     ";
4F   6022 PRINT"FILE OR DO YOU WA
     NT TO LOAD A PROGRAM"
68   6023 INPUT"NOW WITHOUT SAVIN
     G IT [RVSON]S[RVSOFF] OR [RV
     SON]L[RVSOFF] ";Q$
25   6024 IFQ$="S"THEN8000
9C   6025 IFQ$<>"L"THEN6021
98   6026 GOTO6190
E3   6030 A1$="******************
     **********************"
B6   6040 A2$="[SPC40]"
40   6050 PRINT"[CLR,DOWN8]";
85   6060 PRINT"[SPC14]P.A.C. SOF
     TWARE"
54   6070 PRINT
8A   6080 PRINT"[SPC17]PRESENTS"
78   6090 PRINT
85   6100 PRINT"[SPC16]MUSILOAD V
     1"
3F   6110 PRINT:PRINT
44   6120 PRINT"[SPC6]WRITTEN BY
     P.A.CROTON 14/8/87"
35   6130 J=22:FORI=1TO12
07   6140 PO=I:GOSUB7000:PRINTA1$
     ;
DF   6150 PO=I-1:GOSUB7000:PRINTA
     2$;
59   6160 PO=J:GOSUB7000:PRINTA1$
     ;
73   6170 PO=J+1:GOSUB7000:PRINTA
     2$;
95   6180 J=J-1:NEXTI:RETURN
8A   6190 PRINT"[CLR]TYPE:'SYS491
     52' TO START AND[SPC12]'SYS4
     0800' TO TURN OFF."
DF   6200 PRINT"THEN LOAD TAPE PR
     OGRAM AS NORMAL."
99   6210 PRINT"[DOWN]COMMANDS AV
     AILABLE WHILE LOADING ARE:-"
FD   6220 PRINT
F5   6230 PRINT"JOYSTICK[SPC16]DE
     SCRIPTION
18   6240 PRINT"--------[SPC16]--
     ---------"
53   6250 PRINT"FIRE[SPC15]FLASH
     BORDER"
70   6260 PRINT"UP[SPC17]AUTO BOR
     DER FLASH ON"
E8   6270 PRINT"DOWN[SPC15]AUTO B
     ORDER FLASH OFF";
3A   6280 PRINT"LEFT[SPC15]VOLUME
      DOWN"
7E   6290 PRINT"RIGHT[SPC14]VOLUM
     E UP"
55   6300 PRINT"FIRE & UP[SPC10]I
     NCREASE FLASH SPEED"
82   6310 PRINT"FIRE & DOWN[SPC8]
     DECREASE FLASH SPEED"
A0   6320 PRINT"FIRE & LEFT[SPC8]
     INCREASE MUSIC SPEED"
6F   6330 PRINT"FIRE & RIGHT[SPC7
     ]DECREASE MUSIC SPEED"
5C   6340 END
7A   7000 PRINT"[HOME]";
1D   7010 FORPP=1TOPO:PRINT"[DOWN
     ]";:NEXT
09   7020 RETURN
A5   8000 PRINT"[CLR]SAVING MUSIL
     OAD"
F0   8010 INPUT"ENTER DEVICE NUMB
     ER 1=TAPE 8 OR 9 DISK ";DE
A6   8020 IFDE<1ORDE>25THEN8000
98   8025 PRINT"HOLD ON A SEC!"
44   8030 DATA-1,-2,-3,-4,-5
81   8040 DATA169,54,133,1,169,8,
     162,8,160,255,32,186,255
89   8050 DATA169,2,162,211,160,2
     ,32,189,255
9D   8060 DATA169,1,133,247,169,8
     ,133,248,162,255,160,127,169
     ,247,32,216,255
13   8070 DATA169,55,133,1,96
E4   8080 READA$:IFA$="-1"THENREA
     DA$:IFA$="-2"THENREADA$:IFA$
     <>"-3"THEN8100
26   8081 IFA$<>"-3"THEN8100
80   8090 READA$:IFA$="-4"THENREA
     DA$:IFA$="-5"THEN8110
DA   8100 GOTO8080
8D   8110 FORI=679TO722:READA:POK
     EI,A:NEXT
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64  8120 N$="MUSILOAD":DEV=DE:S=
    49152:E=53246
99  8130 K=S:GOSUB8200:POKE702,A
    1:POKE706,A2
6F  8140 K=E:GOSUB8200:POKE710,A
    1:POKE712,A2
48  8150 POKE688,255
2E  8160 POKE693,8
E5  8170 FORI=1TO8:POKE722+I,ASC
    (MID$(N$,I,1)):NEXT
B1  8180 POKE684,DEV:POKE686,DEV

C7  8190 SYS679
FB  8195 PRINT"[CLR]YOUR PROGRAM
     IS NOW SAVED UNDER THE NAME
    MUSILOAD"
81  8196 PRINT"LOAD IT WITH LOAD
    'MUSILOAD',DEVICE,1"
A4  8197 PRINT"[DOWN]PRESS ANY K
    EY.":POKE198,0:WAIT198,1:GOT
    O6190
8A  8200 A2=INT(K/256):A1=K-A2*2
    56:RETURN
AE  10000 FORI=1TO96:READA$(I),A
    (I):NEXT
6F  10004 NN=0:HN=0
16  10005 PRINT"[CLR]MUSILOAD MU
    SIC EDITOR."
DE  10010 PRINT"[DOWN2]"
BD  10020 PRINT"1. ENTER NOTE."
16  10030 PRINT"2. ERASE NOTE."
65  10040 PRINT"3. VIEW NOTES."
B4  10050 PRINT"4. PLAY TUNE."
60  10060 PRINT"5. FINSHED."
38  10065 PRINT"6. INSERT NOTE."

82  10070 GETA$:IFVAL(A$)<1ORVAL
    (A$)>6THEN10070
5F  10080 IFA$="1"THEN11000
41  10090 IFA$="2"THEN12000
73  10100 IFA$="3"THEN13000
6D  10110 IFA$="4"THEN14000
7F  10120 IFA$="5"THEN15000
A4  10125 IFA$="6"THEN16000
E6  10130 GOTO10070
DB  11000 PRINT"[CLR]ENTER NOTE
    ";NN
0F  11010 PRINT"ENTER NOTE NUMBE
    R OR PRESS RETURN IF[SPC4]AB
    OVE IS CORRECT."
4C  11020 A$="":INPUTA$
76  11030 IFA$=""THEN11040
0F  11035 NN=VAL(A$)
E1  11040 IFNN<0ORNN>460THEN1100
    0
1D  11045 IFNN>HNTHENHN=NN
43  11050 PRINT"ENTER NOTE FOR V
    OICE 1";:INPUTN1$
F3  11060 PRINT"ENTER NOTE FOR V
    OICE 2";:INPUTN2$
6F  11070 PRINT"ENTER NOTE FOR V
    OICE 3";:INPUTN3$
4E  11080 PRINT"ENTER DURATION O
    F NOTE";:INPUTDU
28  11090 FORI=1TO96:IFN1$=A$(I)
    THEN11100
24  11095 NEXTI:PRINT"ERROR":GOT
    O11050
DA  11100 F1=A(I):FORI=1TO96:IFN
    2$=A$(I)THEN11110
AD  11105 NEXTI:PRINT"ERROR":GOT
    O11060
4D  11110 F2=A(I):FORI=1TO96:IFN
    3$=A$(I)THEN11120
AA  11115 NEXTI:PRINT"ERROR":GOT
    O11070
11  11120 F3=A(I):IFDU<0ORDU>255
    THENPRINT"ERROR":GOTO11080
D4  11130 K=F1:GOSUB8200:POKE500
    00+(NN*7),A1:POKE50000+(NN*7
    )+1,A2
3F  11140 K=F2:GOSUB8200:POKE500
    00+(NN*7)+2,A1:POKE50000+(NN
    *7)+3,A2
1C  11150 K=F3:GOSUB8200:POKE500
    00+(NN*7)+4,A1:POKE50000+(NN
    *7)+5,A2
44  11160 POKE50000+(NN*7)+6,DU
11  11170 NN=NN+1:GOTO10005
8B  12000 PRINT"[CLR]ERASE NOTE.
    ":A$=""
92  12010 INPUT"PLEASE ENTER THE
     NOTE TO ERASE OR PRESS RETU
    RN IF NONE";A$
19  12020 IFA$=""THEN10005
2F  12030 A=VAL(A$):IFA<0ORA>460
    THEN12000
59  12040 PRINT"[CLR]PLEASE WAIT
    !"
F2  12050 FORI=ATO459
A3  12060 POKE50000+(I*7),PEEK(5
    0000+((I+1)*7))
63  12070 POKE50000+(I*7)+1,PEEK
    (50000+((I+1)*7)+1)
27  12080 POKE50000+(I*7)+2,PEEK
    (50000+((I+1)*7)+2)
33  12090 POKE50000+(I*7)+3,PEEK
    (50000+((I+1)*7)+3)
EF  12100 POKE50000+(I*7)+4,PEEK
    (50000+((I+1)*7)+4)
33  12110 POKE50000+(I*7)+5,PEEK
    (50000+((I+1)*7)+5)
57  12120 POKE50000+(I*7)+6,PEEK
    (50000+((I+1)*7)+6)
D8  12130 PRINT"[HOME,DOWN,SPC5,
    LEFT5]";(460-A)-I+A
19  12140 NEXT
E2  12150 GOTO10005
74  13000 PRINT"[CLR]VIEW NOTES.
    "
63  13010 INPUT"STARTING NOTE ";
    SN
1E  13020 IFSN<0ORSN>460THEN1300
    0
EB  13030 FORI=SNTO460
3F  13040 PRINTI;
5E  13050 H1=PEEK(50000+(I*7))
AC  13060 L1=PEEK(50000+(I*7)+1)

E4  13070 H2=PEEK(50000+(I*7)+2)

E5  13080 L2=PEEK(50000+(I*7)+3)

0D  13090 H3=PEEK(50000+(I*7)+4)

32  13100 L3=PEEK(50000+(I*7)+5)

79  13110 DU=PEEK(50000+(I*7)+6)

05  13120 F1=L1*256+H1
BE  13130 F2=L2*256+H2
97  13140 F3=L3*256+H3
76  13150 FORJ=1TO96:IFF1=A(J)TH
    EN13159
62  13155 NEXTJ:N1$="NU":GOTO131
    60
C1  13159 N1$=A$(J)
AA  13160 FORJ=1TO96:IFF2=A(J)TH
    EN13169
08  13165 NEXTJ:N2$="NU":GOTO131
    70
18  13169 N2$=A$(J)
DA  13170 FORJ=1TO96:IFF3=A(J)TH
    EN13179
F6  13175 NEXTJ:N3$="NU":GOTO131
    80
07  13179 N3$=A$(J)
5A  13180 PRINTN1$;" ";N2$;" ";N
    3$;DU
E5  13185 GETA$:IFA$=CHR$(13)THE
    N10005
84  13190 NEXTI
80  13200 GOTO10005
48  14000 PRINT"[CLR]PLAY TUNE.R
    ETURN STOPS,"
06  14010 FORI=54272TO54296:POKE
    I,0:NEXT
AE  14020 POKE54296,15:POKE54277
    ,9:POKE54284,9:POKE54291,9
1A  14030 POKE54278,128:POKE5428
    5,128:POKE54292,128
74  14040 FORI=0TO460
0E  14050 L1=PEEK(50000+(I*7))
C5  14060 H1=PEEK(50000+(I*7)+1)

F5  14070 L2=PEEK(50000+(I*7)+2)

ED  14080 H2=PEEK(50000+(I*7)+3)

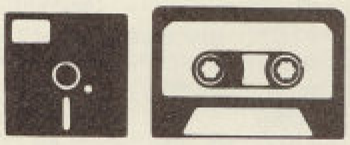
3D  14090 L3=PEEK(50000+(I*7)+4)

62  14100 H3=PEEK(50000+(I*7)+5)

D5  14110 DU=PEEK(50000+(I*7)+6)

84  14120 POKE54272,L1:POKE54273
    ,H1
75  14130 POKE54279,L2:POKE54280
    ,H2
A6  14140 POKE54286,L3:POKE54287
    ,H3
65  14150 POKE54276,33:POKE54283
    ,33
B7  14160 POKE54290,33:FORJ=1TOD
    U:NEXT
5F  14170 GETA$:IFA$=CHR$(13)THE
    NFORI=54272TO54296:POKEI,0:N
    EXT:GOTO10005
62  14180 NEXTI
0A  15000 I=50000+(HN*7)+7:GOTO6
    000
A5  16000 PRINT"[CLR]INSERT NOTE
    ."
F7  16010 INPUT"INSERT A NOTE AF
    TER NOTE ";IN
85  16020 IFIN<0ORIN>459THEN1600
    0
37  16030 PRINT"[CLR]PLEASE WAIT
    ."
EB  16040 FORI=459TOIN+1STEP-1
28  16050 POKE50000+((I+1)*7),PE
    EK(50000+(I*7))
88  16060 POKE50001+((I+1)*7),PE
    EK(50001+(I*7))
74  16070 POKE50002+((I+1)*7),PE
    EK(50002+(I*7))
EC  16080 POKE50003+((I+1)*7),PE
    EK(50003+(I*7))
D8  16090 POKE50004+((I+1)*7),PE
    EK(50004+(I*7))
28  16100 POKE50005+((I+1)*7),PE
    EK(50005+(I*7))
24  16110 POKE50006+((I+1)*7),PE
    EK(50006+(I*7))
67  16120 PRINT"[HOME,DOWN,SPC4,
    LEFT4]";I-IN
0C  16130 NEXTI
3F  16140 NN=IN+1
8C  16150 GOTO11000
```

Weos II



PROGRAM: WEOS DEMO

```
10 COLOUR0,5:COLOUR1,5:COLOUR2,1
```

```
3:GOSUB1890:DESK98
20 PRINTCHR$(14)CHR$(8)
100 GOSUB1380:PAUSE0
110 GOSUB1180:PAUSE0:MENU2ON:PAU
SE0:MENUOFF:PAUSE0
120 WSWAP:PAUSE0:WCLOSE:PAUSE0:W
MOVE5,5
130 PAUSE0:GOSUB1180:PAUSE0:WCOP
Y1,1
140 PAUSE0:WCLOSE:PAUSE0:WMOVE7,
10
150 PAUSE0:GOSUB1630::PAUSE0:WSW
AP
160 PAUSE0:GOSUB1380:PAUSE0:WSWA
P:PAUSE0
165 MENU1ON:PAUSE0:MENUOFF
170 WCLOSE:PAUSE0:WCLOSE:PAUSE0:
WCLOSE:PAUSE0:WCLOSE:PAUSE0:GOSU
B1000
180 PAUSE0:GOSUB1180:PAUSE0:GOSU
B1270:PAUSE0:GOSUB1630:PAUSE0:WS
WAP:PAUSE0
181 MENU3ON:PAUSE0:MENUOFF:PAUSE
0
190 WCLOSE:PAUSE0:WCOPY5,4:PAUSE
0:WCLOSE:PAUSE0:WSWAP:PAUSE0:WCL
OSE:PAUSE0
200 GOSUB1720:WCLOSE:PAUSE0:WCLO
SE:PAUSE0:RUN
1000 WOPEN0,2,40,19,"PROGNOSE",1
1010 WPRINT"▣            ↑          !
       ─      ─      ■";
1020 WPRINT"▣ 3■♠ALES            10
00       1150       1322";
1030 WPRINT"▣ 4■─OSTS             3
50       402        463";
1040 WPRINT"▣ 5■─ROFIT            6
50       748        860";
1050 WPRINT"▣ 6■"
1060 WPRINT"▣ 7■ ─┌♠│♠ ─┌─  ↑♠╱♠
─╲ 1986"
1070 WPRINT"▣ 8■        ─AR        2
50       288        331";
1080 WPRINT"▣ 9■      ─ALLS ▣
100■        115        132";
1090 WPRINT"▣10■   ♠ALARY          1
50       172        198";
1100 WPRINT"▣11■               -------
--------------------";
1110 WPRINT"▣12■ OTAL              5
00       575        861";
1120 WPRINT"▣13■"
1130 WPRINT"▣14■─ETT              1
50       172        198";
1140 WPRINT"▣15■"
1150 WPRINT"─ELL:!9      [         10
0]"
1160 WPRINT"!9>115 !!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!";
1170 RETURN
1180 WOPEN3,3,30,10,"ADDRESS",6,
1,14
1190 WPRINT"    ╱AME:  ╲IM"
1200 WPRINT"           ♠MITH"
1210 WPRINT"    ♠EX:  MALE
1220 WPRINT"↑DDRESS:  271 ↑NYSTRE
ET,"
1230 WPRINT"             ↑NYWHERE"
1240 WPRINT"─OMMENT:  ↑MBITIOUS"
1250 WPRINT"▣ ▣─╲ ■ ▣ ╱─♠│ ■ ▣
─╲╱│ ■ ▣ ─╲│■";
1260 RETURN
1270 WOPEN2,10,36,12,"LETTER.DOC
",2,1,12
1280 WPRINT"─:03 ─:002 ─:02"
1290 WPRINT".▣.■..!.....1....!..
..2....!....3...";
1300 WPRINT"▣ ▣─■EAR ♠IR,
1310 WPRINT"▣    ┌UR 5 YEAR PLAN
HAS SUCCESS, OU";
1320 WPRINT"ANY PRODUCTS ARE MUC
H IMPROVED NOW";
1330 WPRINT" 12% OF OUR EMPLOYEE
S ARE SPIES BU";
1340 WPRINT"ORE FOLKS ARE TALKIN
G ABOUT US←"
1350 WPRINT"AN YOU ASK FOR MORE
MONEY?←";
1370 RETURN
1380 WOPEN2,7,31,16,"GRAPHS",6,1
,11
1390 WPRINT"    ♠ALES ♠URVEY '88 ↑
QUA♠OFT"
1400 WPRINT"   -----------------
-------"
1420 WPRINT"900 ─
      -
1430 WPRINT"800 ─
     - -
1440 WPRINT"700 ─           ---
      -
1450 WPRINT"600 ─       -- --   -
--
1460 WPRINT"500 ─      -   -
-
1470 WPRINT"400 ─-    -
1480 WPRINT"300 ─ - -
1490 WPRINT"200 ─  -
1500 WPRINT"100 ─
1600 WPRINT"  0 ──────────────────
────────"
1610 WPRINT"        ╲ ─ ╲ ↑ ╲ ╲ ↑
♠ ┌ ╱ ─";
1620 RETURN
1630 WOPEN2,1,26,10,"WEOS64.SYS"
,7,1,6
1640 WPRINT"DESKTOP.APP"
1650 WPRINT"WEOS64.BOOT"
1660 WPRINT"▣WEOBASIC.CODE
     ■";
1670 WPRINT"DUMMY 1"
1680 WPRINT"DUMMY 2"
1690 WPRINT"DEFAULT.DATA"
1700 WPRINT"▣ <─┐─╲>            <╱
─♠│>";
1710 RETURN
1720 SOPEN30,17,9,1,0:WPRINT"
 ─NTER !OUR ─HOICE"
1730 WPRINT"     ──────────────
──"
1740 WPRINT" ! ─ISK ─IRECTORY"
1750 WPRINT" ! ─ORMAT ─ISK"
1760 WPRINT" ! ╲NITIALISE ─ISK"
1770 WPRINT" ! ─ATALOG ─ISK"
1780 WPRINT" ! ─HANGE ─ROGRAM ╱A
ME"
1790 WPRINT" ! ─ELETE ─ROGRAM"
1800 WPRINT" ! ─EAD ─RROR ─HANNE
L"
1810 WPRINT" ! ─HANGE ─ISK ╲─"
1820 WPRINT" ! ─HANGE ─ISK ╱AME"
1830 WPRINT" ! ○RITE ─ROTECT ─RO
GRAM"
1840 WPRINT" ! ○RITE ─ROTECT ─IS
K"
1860 WPRINT" -------------------
-------";
1870 PAUSE0:SCLOSE:PAUSE0
1880 RETURN
1890 MENU1,12,7,1,"○╲─♠○─♠─┌─
╱←┘┌♠─╱┐╳─←┌┐│←│ ─♠╱♠─♠─←♠─┘─
─│←",7,6,1
1900 A$="─OMPANY←─OMMODORE ╱─←─O
MMODORE ♠←─OMMODORE ╱♠^"
1920 A$=A$+"─ISION ♠YSTEMS←╳ISI─O
RP←─OMPSOFT^"
1930 MENU2,20,13,0,A$,15,7,1,6
1940 B$="─OMPUTERS←─OMMODORE ─16
←─OMMODORE +4←─OMMODORE 128←─OMM
ODORE 128─←"
1950 B$=B$+"↑MIGA 500←↑MIGA 1000
←↑MIGA 2000←─OMMODORE ─^"
1960 MENU3,16,15,0,B$,8,4,1,3
1970 RETURN
```

+ 4 Assembler

PROGRAM: ASSEMBLER.LDR

```
10 AD=4097
20 FOR LN=160 TO 2380 STEP 10
30 RT=0
40 FOR OS=0 TO 15
50 READ BY:POKE AD+OS,BY:RT=RT+B
Y
60 NEXT
70 READ CK:IF RT<>CK THEN PRINT
"─ATA ERROR IN LINE";LN:STOP
80 AD=AD+16
90 NEXT
100 PRINT "♠AVING ─ROGRAM."
110 POKE 43,1:POKE 44,16:POKE 45
,0:POKE 46,30:SAVE"ASMB.EXE",8
120 PRINT "─ROGRAM ♠AVED. ─ESET
MACHINE BEFORE     CONTINUING."
130 END
140 :
150 :
160 DATA 12,16,10,0,158,32,52,49
,49,49,0,0,0,0,76,170, 673
170 DATA 26,0,0,112,108,0,2,0,0,
0,2,59,112,2,2,66, 491
180 DATA 82,75,0,67,76,67,24,67,
76,68,216,67,76,73,88,67, 1189
190 DATA 76,86,184,68,69,88,218,
68,69,89,136,73,78,88,232,73, 16
95
200 DATA 78,89,216,78,79,80,234,
80,72,65,72,80,72,80,8,80, 1463
210 DATA 76,65,104,80,76,80,40,8
2,84,73,64,82,84,83,96,83, 1252
220 DATA 69,67,56,83,69,68,248,8
3,69,73,120,84,65,88,170,84, 149
6
230 DATA 65,89,168,84,83,88,186,
84,88,65,138,84,88,83,154,84, 16
31
240 DATA 89,65,152,66,67,67,144,
66,67,83,176,66,69,81,240,66, 15
64
250 DATA 77,73,48,66,78,69,208,6
6,80,76,16,66,86,67,80,66, 1222
260 DATA 86,83,112,65,68,67,0,65
,78,68,11,65,83,76,22,66, 1015
270 DATA 73,84,33,67,77,80,44,67
,80,88,55,67,80,89,66,68, 1118
280 DATA 69,67,77,69,79,82,88,73
,78,67,99,74,77,80,110,74, 1263
290 DATA 83,82,121,76,68,65,132,
76,68,88,143,76,68,89,154,76, 14
65
300 DATA 83,82,165,79,82,65,176,
82,79,76,187,82,79,82,198,83, 16
80
310 DATA 66,67,209,83,84,65,220,
83,84,88,231,83,84,89,242,66, 18
44
320 DATA 89,84,0,87,79,82,1,69,8
1,90,2,69,81,65,3,79, 961
330 DATA 82,71,4,82,69,83,5,0,0,
0,0,0,0,0,0,255, 651
```

```
340 DATA 105,101,117,255,109,125,121,97,113,255,255,41,37,53,255,45, 2084
350 DATA 61,57,33,49,255,10,255,6,22,255,14,30,255,255,255,255, 2067
360 DATA 255,255,36,255,255,44,255,255,255,255,255,255,255,201,197,213,255, 3496
370 DATA 205,221,217,193,209,255,255,224,228,255,255,236,255,255,255,255, 3773
380 DATA 255,255,192,196,255,255,204,255,255,255,255,255,255,255,198,214, 3809
390 DATA 255,206,222,255,255,255,255,255,73,69,85,255,77,93,89,65, 2764
400 DATA 81,255,255,255,230,246,255,238,254,255,255,255,255,255,255,255, 3854
410 DATA 255,255,76,255,255,255,255,108,255,255,255,255,255,32,255,255, 3531
420 DATA 255,255,255,255,169,165,181,255,173,189,185,161,177,255,255,162, 3347
430 DATA 166,255,182,174,255,190,255,255,255,255,160,164,180,255,172,188, 3361
440 DATA 255,255,255,255,74,255,70,86,255,78,94,255,255,255,255,255, 3207
450 DATA 9,5,21,255,13,29,25,1,17,255,42,255,38,54,255,46, 1320
460 DATA 62,255,255,255,255,106,255,102,118,255,110,126,255,255,255,255, 3174
470 DATA 255,233,229,245,255,237,253,249,225,241,255,255,255,133,149,255, 3724
480 DATA 141,157,153,129,145,255,255,255,134,255,150,142,255,255,255,255, 3191
490 DATA 255,255,255,132,148,255,140,255,255,255,255,255,255,255,255,193, 3673
500 DATA 83,83,69,77,66,76,89,32,198,65,73,76,83,32,79,78, 1259
510 DATA 32,84,72,73,83,32,76,73,78,69,46,0,211,89,77,66, 1161
520 DATA 79,76,32,213,78,68,69,70,73,78,69,68,46,0,211,89, 1319
530 DATA 77,66,79,76,32,210,69,68,69,70,73,78,69,68,46,0, 1150
540 DATA 205,78,69,77,79,78,73,67,32,206,79,84,32,210,69,67, 1505
550 DATA 79,71,78,73,83,69,68,46,0,194,65,68,32,211,89,77, 1303
560 DATA 66,79,76,46,0,201,76,76,69,71,65,76,32,207,80,69, 1289
570 DATA 82,65,78,68,32,198,73,69,76,68,46,0,201,76,76,69, 1277
580 DATA 71,65,76,32,205,78,69,77,79,78,73,67,32,198,73,69, 1342
590 DATA 76,68,46,0,205,73,83,83,73,78,71,32,207,80,69,82, 1326
600 DATA 65,78,68,32,198,73,69,76,68,46,0,196,73,83,75,32, 1232
610 DATA 198,73,76,69,32,69,82,82,79,82,46,0,211,89,78,84, 1350
620 DATA 65,88,32,197,82,82,79,82,46,0,201,76,76,69,71,65, 1311
630 DATA 76,32,209,85,65,78,84,73,84,89,46,0,201,76,76,69, 1343
640 DATA 71,65,76,32,65,68,68,82,69,83,83,73,78,71,32,77, 1093
650 DATA 79,68,69,46,0,206,79,84,32,216,32,79,82,32,217,32, 1353
660 DATA 73,78,68,69,88,0,32,18,61,18,79,18,97,18,122,18, 857
670 DATA 134,18,157,18,181,18,204,18,221,18,235,18,253,18,22,19, 1552
680 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,169, 169
690 DATA 32,162,16,133,20,134,21,162,0,160,2,185,1,2,209,20, 1259
700 DATA 208,9,136,16,246,160,3,177,20,24,96,232,224,62,176,250, 2039
710 DATA 165,20,105,4,133,20,165,21,105,0,133,21,76,90,19,173, 1250
720 DATA 0,2,201,3,240,5,162,3,76,146,19,32,80,19,176,246, 1410
730 DATA 96,32,112,27,189,40,19,168,189,39,19,170,32,165,19,76, 1392
740 DATA 96,29,234,234,134,20,132,21,160,0,177,20,240,6,32,210, 1745
750 DATA 255,200,208,246,96,0,0,0,0,0,0,0,0,0,0,201, 1206
760 DATA 65,144,6,201,91,176,2,56,96,24,96,201,48,144,250,201, 1801
770 DATA 58,176,246,144,242,32,204,19,176,240,76,192,19,32,204,19, 2079
780 DATA 176,232,201,65,144,227,201,71,176,223,144,219,234,234,234,76, 2857
790 DATA 0,25,234,234,170,32,10,20,32,214,19,176,4,142,0,2, 1314
800 DATA 96,157,1,2,232,208,238,234,234,230,61,208,2,230,62,140, 2335
810 DATA 31,16,160,0,177,61,172,31,16,96,234,234,234,234,234,165, 2095
820 DATA 45,166,46,133,112,134,113,160,0,177,112,208,2,24,96,205, 1733
830 DATA 0,2,208,40,162,0,200,200,200,200,177,112,221,1,2,208, 1933
840 DATA 27,232,236,0,2,144,242,160,1,177,112,141,30,16,200,177, 1897
850 DATA 112,141,28,16,200,177,112,141,29,16,56,96,76,32,25,32, 1289
860 DATA 16,20,201,32,240,1,96,32,10,20,76,99,20,234,234,32, 1363
870 DATA 10,20,32,240,19,173,0,2,208,5,162,4,76,146,19,32, 1148
880 DATA 32,20,144,12,162,2,173,27,16,201,1,208,5,76,146,19, 1244
890 DATA 162,0,169,1,141,26,16,224,0,240,1,96,160,0,173,0, 1409
900 DATA 2,145,23,200,169,2,145,23,200,165,63,145,23,200,165,64, 1734
910 DATA 145,23,200,162,0,189,1,2,145,23,232,200,236,0,2,208, 1768
920 DATA 244,152,24,101,23,133,23,165,24,105,0,133,24,201,128,208, 1688
930 DATA 5,162,0,76,146,19,160,0,152,145,23,96,234,234,234,169, 1855
940 DATA 0,133,65,133,66,32,10,20,32,222,19,176,1,96,201,65, 1271
950 DATA 176,4,41,15,144,2,233,55,24,6,65,38,66,176,25,6, 1076
960 DATA 65,38,66,176,19,6,65,38,66,176,13,6,65,38,66,176, 1079
970 DATA 7,5,65,133,65,76,230,20,162,10,76,146,19,234,234,76, 1558
980 DATA 64,25,234,234,234,32,10,20,32,204,19,176,1,96,41,15, 1437
990 DATA 72,165,66,72,165,65,72,6,65,38,66,176,219,6,65,38, 1356
1000 DATA 66,176,213,24,104,101,65,133,65,104,101,66,133,66,176,200, 1793
1010 DATA 6,65,38,66,176,194,76,80,25,234,234,234,234,234,234,32, 2162
1020 DATA 10,20,133,65,169,0,133,66,32,10,20,201,39,240,5,162, 1305
1030 DATA 8,76,146,19,76,10,20,234,234,76,145,21,173,25,16,240, 1519
1040 DATA 36,201,60,240,4,165,66,133,65,169,0,133,66,76,166,21, 1601
1050 DATA 32,16,20,201,13,240,229,201,40,240,225,201,41,240,221,201, 2361
1060 DATA 44,208,17,240,215,169,1,141,23,16,165,66,240,5,169,2, 1721
1070 DATA 141,23,16,96,201,43,240,4,201,45,208,72,173,24,16,240, 1743
1080 DATA 5,162,9,76,146,19,238,24,16,165,66,72,165,65,72,32, 1332
1090 DATA 16,20,72,32,10,20,32,122,21,104,201,43,240,24,166,65, 1188
1100 DATA 164,66,104,133,65,104,133,66,56,138,229,65,133,65,152,229, 1902
1110 DATA 66,133,66,76,122,21,24,104,101,65,133,65,104,101,66,133, 1380
1120 DATA 66,76,122,21,162,0,142,24,16,234,234,234,201,60,240,4, 1836
1130 DATA 201,62,208,6,141,25,16,32,10,20,201,39,208,6,32,96, 1303
1140 DATA 21,76,122,21,32,192,19,144,57,32,240,19,32,32,20,176, 1235
1150 DATA 25,169,1,141,22,16,173,27,16,201,2,208,5,162,2,76, 1246
1160 DATA 146,19,169,2,141,23,16,76,122,21,169,0,234,234,234,173, 1779
1170 DATA 28,16,133,65,173,29,16,133,66,173,30,16,141,23,16,76, 1134
1180 DATA 122,21,201,36,240,4,201,38,208,6,32,224,20,76,122,21, 1572
1190 DATA 32,204,19,144,6,32,32,21,76,122,21,162,5,76,146,19, 1117
1200 DATA 234,234,234,234,234,234,234,234,234,173,23,16,24,105,1,24, 2472
1210 DATA 101,63,133,63,165,64,105,0,133,64,173,27,16,201,2,240, 1550
1220 DATA 1,96,162,3,32,201,255,173,21,16,32,210,255,172,23,16, 1668
1230 DATA 240,13,165,65,32,210,255,136,240,5,165,66,32,210,255,76, 2165
1240 DATA 204,255,141,21,16,169,0,141,23,16,76,138,22,141,21,16,
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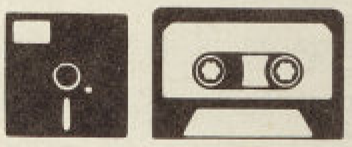
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1250 DATA 32,122,21,173,27,16,20
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1260 DATA 38,165,63,24,105,2,170
,165,64,105,0,168,165,65,134,65,
 1498
1270 DATA 166,66,132,66,56,229,6
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55, 2066
1280 DATA 240,5,201,0,208,9,234,
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1290 DATA 1,76,146,19,234,234,23
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, 1654
1300 DATA 17,105,0,133,70,32,16,
20,201,65,208,24,160,1,177,61, 1
290
1310 DATA 201,13,240,4,201,32,20
8,12,32,10,20,169,0,141,23,16, 1
322
1320 DATA 168,76,58,24,201,35,20
8,33,32,10,20,32,122,21,173,22,
1235
1330 DATA 16,240,5,169,1,141,23,
16,173,23,16,201,1,240,5,162, 14
32
1340 DATA 10,76,146,19,160,1,76,
58,24,201,40,240,81,32,122,21, 1
307
1350 DATA 173,22,16,240,5,169,2,
141,23,16,173,23,16,201,1,208, 1
429
1360 DATA 2,160,2,201,2,208,2,16
0,5,173,21,16,201,110,240,4, 150
7
1370 DATA 201,121,208,2,160,5,19
2,5,208,5,169,2,141,23,16,32, 14
90
1380 DATA 16,20,201,44,240,3,76,
58,24,32,10,20,201,88,240,10, 12
83
1390 DATA 201,89,240,5,162,12,76
,146,19,200,200,76,58,24,32,10,
1550
1400 DATA 20,32,122,21,32,16,20,
201,41,240,53,173,22,16,240,5, 1
254
1410 DATA 169,1,141,23,16,173,23
,16,201,1,208,5,162,10,76,146, 1
371
1420 DATA 19,32,16,20,201,44,240
,5,162,9,76,146,19,32,10,20, 105
1
1430 DATA 201,88,208,244,32,10,2
0,201,57,208,237,160,8,76,58,24,
 1832
1440 DATA 32,10,20,201,44,240,10
,169,2,141,23,16,160,10,76,58, 1
212
1450 DATA 24,173,22,16,240,5,169
,1,141,23,16,173,23,16,201,1, 12
44
1460 DATA 240,5,162,10,76,146,19
,32,10,20,201,89,208,186,160,9,
1573
1470 DATA 76,58,24,234,234,234,2
34,234,234,177,69,201,255,240,6,
141, 2651
1480 DATA 21,16,76,138,22,162,11
,208,219,224,56,144,3,76,96,25,
1497
1490 DATA 224,33,144,3,76,24,23,
224,25,144,3,76,206,22,76,195, 1
498
1500 DATA 22,32,33,29,32,0,29,32
,16,25,144,1,96,173,27,16, 707
1510 DATA 201,2,208,3,32,48,27,1
69,0,141,22,16,141,26,16,141, 11
93
1520 DATA 25,16,141,24,16,32,104
,20,201,59,240,219,201,46,208,6,
1558
1530 DATA 32,112,20,32,96,20,201
,13,240,205,32,192,19,176,5,162,
1557
1540 DATA 6,76,146,19,32,240,19,
32,128,19,72,32,96,20,104,32, 10
73
1550 DATA 74,24,76,104,24,234,23
4,162,2,32,198,255,32,228,255,14
1, 2075
1560 DATA 50,3,32,228,255,141,51
,3,208,9,173,50,3,208,4,56, 1474
1570 DATA 76,235,24,32,228,255,1
41,52,3,32,228,255,141,53,3,76,
1834
1580 DATA 64,27,234,234,234,234,
234,234,234,234,32,204,255,56,96
,198, 2804
1590 DATA 61,165,61,201,255,208,
2,198,62,96,234,234,234,234,234,
32, 2511
1600 DATA 240,24,169,0,141,0,2,7
6,245,19,234,234,234,234,234,32,
2118
1610 DATA 184,24,8,169,53,162,3,
133,61,134,62,40,96,234,234,160,
 1757
1620 DATA 0,177,112,24,105,4,101
,112,133,112,144,2,230,113,76,40
, 1485
1630 DATA 20,234,234,234,234,234
,234,234,234,234,234,234,234,234
,234,169, 3465
1640 DATA 0,133,65,133,66,32,240
,24,76,38,21,234,234,234,234,104
, 1868
1650 DATA 24,101,65,133,65,165,6
6,105,0,133,66,76,38,21,234,224,
 1516
1660 DATA 56,208,3,76,176,25,224
,57,208,3,76,251,25,224,58,208,
1878
1670 DATA 3,76,64,26,224,59,208,
3,76,112,26,224,60,208,3,76, 144
8
1680 DATA 160,25,234,234,234,32,
122,21,165,65,24,101,63,133,63,1
65, 1841
1690 DATA 66,101,64,133,64,76,19
2,29,32,10,20,76,207,25,234,32,
1361
1700 DATA 122,21,165,65,166,66,7
6,136,27,234,234,234,32,104,20,3
2, 1734
1710 DATA 96,20,201,39,240,41,32
,122,21,165,66,240,5,162,10,76,
1536
1720 DATA 146,19,160,0,32,80,29,
234,230,63,208,2,230,64,32,96, 1
625
1730 DATA 20,201,44,240,215,201,
13,208,1,96,162,9,76,146,19,32,
1683
1740 DATA 10,20,201,39,240,178,1
33,65,32,80,29,230,63,208,2,230,
 1760
1750 DATA 64,76,224,25,234,234,2
34,32,104,20,32,122,21,32,88,29,
1571
1760 DATA 234,234,234,234,234,23
4,234,234,165,63,24,105,2,133,63
,165, 2592
1770 DATA 64,105,0,133,64,32,96,
20,201,44,240,219,201,13,208,1,
1641
1780 DATA 96,162,9,76,146,19,234
,234,234,234,234,234,234,234,234
,173, 2787
1790 DATA 26,16,240,1,96,162,9,7
6,146,19,234,234,234,234,234,32,
 1993
1800 DATA 48,26,165,113,72,165,1
12,72,32,122,21,104,133,112,104,
133, 1534
1810 DATA 113,165,66,240,5,162,1
0,76,146,19,160,1,169,1,145,112,
 1590
1820 DATA 200,165,65,145,112,165
,66,200,145,112,96,234,234,234,2
34,32, 2439
1830 DATA 48,26,165,113,72,165,1
12,72,32,122,21,104,133,112,104,
133, 1534
1840 DATA 113,160,1,169,2,145,11
2,76,97,26,234,234,234,234,234,1
69, 2240
1850 DATA 0,133,63,133,64,165,45
,166,46,133,23,134,24,160,0,152,
 1441
1860 DATA 145,23,96,234,234,234,
234,234,234,32,176,29,32,24,28,3
2, 2021
1870 DATA 144,26,169,1,141,27,16
,32,144,28,32,98,24,169,2,32, 10
85
1880 DATA 195,255,238,27,16,32,1
44,28,32,192,28,32,98,24,169,3,
1513
1890 DATA 32,195,255,169,2,32,19
5,255,76,163,29,234,234,234,234,
134, 2473
1900 DATA 20,132,21,160,0,177,20
,32,210,255,200,201,13,208,246,9
6, 1991
1910 DATA 162,54,160,3,76,224,26
,234,234,234,234,234,234,234,234
,201, 2778
1920 DATA 10,176,3,9,48,96,105,5
4,96,72,74,74,74,74,32,0, 997
1930 DATA 27,32,210,255,104,41,1
5,32,0,27,76,210,255,165,64,32,
1545
1940 DATA 10,27,165,63,76,10,27,
234,234,234,234,234,234,234,234,
32, 2282
1950 DATA 30,27,169,32,32,210,25
5,76,241,26,234,234,234,234,234,
169, 2437
1960 DATA 54,162,3,133,20,134,21
,32,228,255,201,0,240,13,160,0,
1656
1970 DATA 145,20,230,20,208,2,23
0,21,76,72,27,169,13,145,20,32,
1430
1980 DATA 204,255,24,96,234,234,
234,234,234,234,234,234,234,234,
234,138, 3291
1990 DATA 10,72,173,27,16,201,1,
208,3,32,241,26,104,96,165,19, 1
394
2000 DATA 104,170,96,234,234,234
,234,133,63,134,64,141,19,16,142
,20, 2038
2010 DATA 16,96,234,234,234,234,
234,234,234,234,234,234,234,234,
234,169, 3323
2020 DATA 0,141,0,2,160,0,32,207
,255,201,13,240,6,153,1,2, 1413
2030 DATA 200,208,243,140,0,2,96
,234,234,234,234,234,234,234,234
,46, 2807
2040 DATA 65,83,77,64,48,58,46,6
9,88,69,44,80,44,87,234,197, 135
3
2050 DATA 78,84,69,82,32,70,73,7
6,69,78,65,77,69,58,0,206, 1186
2060 DATA 79,32,78,65,77,69,32,8
3,80,69,67,73,70,73,69,68, 1084
2070 DATA 46,197,88,73,84,73,78,
71,13,0,0,0,0,0,0,198, 921
2080 DATA 73,76,69,78,65,77,69,3
2,84,79,79,32,76,79,78,71, 1117
2090 DATA 13,0,0,0,0,0,0,162,208
,160,27,32,165,19,32,160, 978
2100 DATA 27,173,0,2,208,12,162,
```

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224,160,27,32,165,19,162,128,108, 1609
2110 DATA 0,3,201,13,144,10,162,0,160,28,32,165,19,76,24,28, 1065
2120 DATA 160,0,185,196,27,153,32,4,200,192,3,208,245,162,0,189, 1956
2130 DATA 1,2,157,0,4,153,32,4,200,232,236,0,2,208,240,162, 1633
2140 DATA 0,189,199,27,153,32,4,232,200,224,8,208,244,140,135,28, 2023
2150 DATA 174,0,2,160,0,185,192,27,157,0,4,200,232,192,4,208, 1737
2160 DATA 244,142,134,28,96,10,17,234,234,234,234,234,234,234,234,169, 2712
2170 DATA 2,168,162,8,32,186,255,173,134,28,162,0,160,4,32,189, 1695
2180 DATA 255,32,192,255,176,73,162,2,32,198,255,32,228,255,32,228, 2407
2190 DATA 255,32,204,255,96,234,234,234,234,234,234,234,234,234,234,169, 3351
2200 DATA 3,168,162,8,32,186,255,173,135,28,162,32,160,4,32,189, 1729
2210 DATA 255,32,192,255,176,25,162,3,32,201,255,173,19,16,32,210, 2038
2220 DATA 255,173,20,16,32,210,255,32,204,255,96,234,234,234,234,32, 2516
2230 DATA 231,255,162,16,76,149,19,234,234,234,234,234,234,234,234,173, 2953
2240 DATA 27,16,9,48,141,23,29,162,17,160,29,32,165,19,96,234, 1207
2250 DATA 13,208,65,83,83,32,50,32,66,69,71,73,78,83,13,0, 1019
2260 DATA 169,0,133,63,133,64,96,234,234,234,234,234,234,234,234,173, 2703
2270 DATA 27,16,201,2,240,1,96,162,3,32,201,255,172,23,16,165, 1612
2280 DATA 65,32,210,255,136,240,5,165,66,32,210,255,76,204,255,169, 2375
2290 DATA 1,141,23,16,76,48,29,169,2,141,23,16,76,48,29,169, 1007
2300 DATA 2,32,195,255,169,3,32,195,255,76,163,29,234,234,14,147, 2035
2310 DATA 13,193,83,83,69,77,66,76,69,82,32,40,208,76,85,83, 1335
2320 DATA 32,52,32,86,50,46,48,49,41,13,40,67,41,32,200,65, 894
2330 DATA 77,83,84,69,82,83,79,70,84,32,49,57,56,55,46,13, 1019
2340 DATA 13,0,169,0,133,24,162,128,108,0,3,234,234,234,234,162, 1838
2350 DATA 111,160,29,76,165,19,234,234,234,234,234,234,234,234,234,173, 2839
2360 DATA 27,16,201,2,240,1,96,162,3,32,201,255,169,0,166,65, 1636
2370 DATA 164,66,202,224,255,208,8,136,192,255,208,3,76,204,255,32, 2488
2380 DATA 210,255,76,211,29,234,234,234,234,234,234,234,234,234,234,234, 3355
```

```
PROGRAM: EDIT.LOADER
```

```
10 FOR X=1552 TO 1595
20 READ A:POKEX,A
30 NEXT
40 POKE 770,16:POKE 771,6:POKE 774,79
50 NEW
60 DATA 162,255,134,58,32,90,136,134
70 DATA 59,132,60,32,115,4,170,240
80 DATA 239,144,3,76,35,135,32,62
90 DATA 142,164,59,185,0,2,240,3
100 DATA 200,208,248,152,56,229,59,168
110 DATA 200,76,52,135
```

Label Linker



```
PROGRAM: BOOT LOADER
```

```
10 POKE DEC("2E"),DEC("40")
20 BANK0
30 POKE DEC("4000"),0
40 POKE DEC("1211"),DEC("40")
50 RUN "DATALOADER"
```

```
PROGRAM: DATALOADER
```

```
10 IF PEEK(DEC("2E")) < 64 THEN RUN "BOOT.LOADER"
20 BANK 0
30 COLOR 0,1:COLOR 4,1:COLOR 5,8
40 PRINT"▯                    LINKER LOADER"
50 PRINT"                      -------------"
60 PRINT "▮▮▮▮▮                    ADDRESS ==> $";
70 SA=8192
80 DO WHILE SA<12432 AND EE=0
90 : READ DT
100 : IF DT < 0 THEN BEGIN
110 :    IF ABS(DT) <> TT THEN EE=1:ELSETT=0
120 : BEND:ELSE BEGIN
130 :  POKE SA,DT:TT=TT+DT
140 :  PRINT HEX$(SA);"■■■■■";:SA=SA+1
150 :BEND
160 LOOP:PRINT
170 IF EE=1 THEN PRINT"▮▮▮▮ERROR IN LINE ";PEEK(65)+PEEK(66)*256:ELSE BEGIN
180 : PRINT"▮▮▮SAVING LABEL-LINKER"
190 : BSAVE "LABEL-LINKER",B0,P8192 TO P12432
200 : PRINT "▮▮PROGRAM SAVED"
210 BEND
220 DATA 32,245,37,32,210,38,147,32,-773
230 DATA 32,32,32,32,32,32,32,32,-256
240 DATA 30,194,65,83,73,67,32,204,-748
250 DATA 73,78,75,69,82,13,32,32,-454
260 DATA 32,32,32,32,32,32,32,45,-269
270 DATA 45,45,45,45,45,45,45,45,-360
280 DATA 45,45,45,0,32,210,38,13,-428
290 DATA 13,155,66,65,83,73,67,32,-554
300 DATA 83,84,65,82,84,32,65,68,-563
310 DATA 68,82,69,83,83,32,40,36,-493
320 DATA 49,67,48,49,41,32,63,32,-381
330 DATA 0,32,171,38,240,20,32,201,-734
340 DATA 37,176,209,173,0,31,174,1,-801
350 DATA 31,141,1,31,142,0,31,76,-453
360 DATA 124,32,169,28,162,1,141,1,-658
370 DATA 31,142,0,31,32,210,38,13,-497
380 DATA 13,155,76,73,78,75,45,77,-592
390 DATA 65,80,32,84,79,32,83,67,-522
400 DATA 82,78,32,79,82,32,80,84,-549
410 DATA 82,32,40,83,47,80,41,32,-437
420 DATA 63,32,0,32,171,38,173,129,-638
430 DATA 31,201,80,208,8,141,24,31,-724
440 DATA 169,13,32,251,38,32,29,39,-603
450 DATA 32,210,38,13,13,159,77,65,-607
460 DATA 73,78,32,77,79,68,85,76,-568
470 DATA 69,32,78,65,77,69,32,62,-484
480 DATA 0,32,171,38,240,223,32,137,-873
490 DATA 47,176,218,32,13,39,32,210,-767
500 DATA 38,13,154,77,79,68,85,76,-590
510 DATA 69,32,78,65,77,69,32,62,-484
520 DATA 0,32,171,38,240,11,32,137,-661
530 DATA 47,176,227,32,13,39,76,222,-832
540 DATA 32,169,0,168,145,251,32,210,-1007
550 DATA 38,13,13,5,204,201,206,203,-883
560 DATA 201,206,199,160,201,206,160,208,-1541
570 DATA 210,207,195,197,211,211,13,0,-1244
580 DATA 32,106,41,173,0,31,133,45,-561
590 DATA 173,1,31,133,46,32,29,39,-484
600 DATA 32,218,35,144,3,76,177,43,-728
610 DATA 169,16,141,137,37,169,18,141,-828
620 DATA 138,37,142,139,37,140,140,37,-810
630 DATA 160,0,173,139,37,32,173,37,-751
```

```
640 DATA 173,140,37,200,32,173,37,32,-824
650 DATA 23,37,76,78,36,144,3,76,-473
660 DATA 57,42,173,3,31,160,17,145,-628
670 DATA 251,24,109,141,37,141,3,31,-737
680 DATA 173,4,31,200,145,251,109,142,-1055
690 DATA 37,141,4,31,32,13,39,160,-457
700 DATA 0,177,251,240,31,169,16,141,-1025
710 DATA 139,37,169,18,141,140,37,160,-841
720 DATA 0,32,143,37,56,233,2,133,-636
730 DATA 45,200,32,143,37,233,0,133,-823
740 DATA 46,76,48,33,32,210,38,147,-630
750 DATA 13,13,158,80,65,83,83,32,-527
760 DATA 49,32,83,84,65,82,84,69,-548
770 DATA 68,13,0,32,106,41,32,127,-419
780 DATA 41,173,0,31,133,45,141,139,-703
790 DATA 37,173,1,31,133,46,141,140,-702
800 DATA 37,32,40,39,169,1,141,7,-466
810 DATA 31,32,54,39,201,0,240,55,-652
820 DATA 201,143,208,245,32,70,35,240,-1174
830 DATA 38,201,36,208,247,32,70,35,-867
840 DATA 240,29,201,34,208,238,32,187,-1169
850 DATA 35,224,0,208,3,76,206,44,-796
860 DATA 224,17,144,3,76,248,44,32,-788
870 DATA 92,35,144,205,76,41,45,169,-807
880 DATA 1,141,7,31,76,217,33,32,-538
890 DATA 219,41,32,210,38,13,13,158,-724
900 DATA 80,65,83,83,32,50,32,83,-508
910 DATA 84,65,82,84,69,68,13,0,-465
920 DATA 32,106,41,32,127,41,165,45,-589
930 DATA 141,139,37,165,46,141,140,37,-846
940 DATA 32,40,39,169,1,141,7,31,-460
950 DATA 32,54,39,201,0,240,111,32,-709
960 DATA 62,41,144,244,173,139,37,141,-981
970 DATA 21,31,173,140,37,141,22,31,-596
980 DATA 32,70,35,208,3,76,138,45,-607
990 DATA 201,32,240,244,201,34,240,15,-1207
1000 DATA 173,21,31,141,139,37,173,22,-737
1010 DATA 31,141,140,37,76,72,34,169,-700
1020 DATA 0,141,20,31,32,168,39,32,-463
1030 DATA 210,38,80,82,73,78,84,13,-658
1040 DATA 0,169,163,141,253,3,169,34,-932
1050 DATA 141,254,3,169,19,32,251,38,-907
1060 DATA 76,118,36,224,128,208,20,173,-983
1070 DATA 9,31,56,233,4,141,139,37,-650
1080 DATA 173,10,31,233,0,141,140,37,-765
1090 DATA 76,67,34,76,58,43,165,45,-564
1100 DATA 56,233,1,141,137,37,165,46,-816
1110 DATA 233,0,141,138,37,160,0,152,-861
1120 DATA 32,173,37,32,1,46,32,210,-563
1130 DATA 38,13,13,153,208,82,79,71,-657
1140 DATA 82,65,77,32,76,73,78,75,-558
1150 DATA 69,68,32,65,78,68,32,67,-479
1160 DATA 79,78,86,69,82,84,69,68,-615
1170 DATA 13,13,82,69,65,68,89,32,-431
1180 DATA 84,79,32,69,88,65,77,73,-567
1190 DATA 78,69,32,65,78,68,32,83,-505
1200 DATA 65,86,69,46,0,32,210,38,-546
1210 DATA 13,13,153,0,32,219,41,169,-640
1220 DATA 63,141,0,3,169,77,141,1,-595
1230 DATA 3,169,0,133,208,32,155,38,-738
1240 DATA 162,7,189,62,35,157,0,2,-614
1250 DATA 202,16,247,76,0,2,169,0,-712
1260 DATA 141,0,255,76,63,77,140,17,-769
1270 DATA 31,238,139,37,208,3,238,140,-1034
1280 DATA 37,160,0,32,143,37,72,172,-653
1290 DATA 17,31,104,96,32,148,35,144,-607
1300 DATA 1,96,173,128,31,160,16,145,-750
1310 DATA 251,168,136,185,129,31,145,251,-1296
1320 DATA 136,16,248,32,52,47,160,17,-708
1330 DATA 173,5,31,145,251,200,173,6,-984
1340 DATA 31,145,251,169,0,160,19,145,-920
1350 DATA 251,32,13,39,169,0,160,0,-664
1360 DATA 145,251,24,96,32,29,39,160,-776
1370 DATA 16,177,251,205,128,31,208,16,-1032
1380 DATA 172,128,31,136,177,251,217,129,-1241
1390 DATA 31,208,5,136,16,246,56,96,-794
1400 DATA 32,13,39,160,0,177,251,208,-880
1410 DATA 222,24,96,162,0,32,70,35,-641
1420 DATA 240,15,201,34,240,16,157,129,-1032
1430 DATA 31,232,224,17,144,239,76,214,-1177
1440 DATA 35,169,1,141,7,31,142,128,-654
1450 DATA 31,96,169,1,133,184,160,20,-794
1460 DATA 177,251,133,186,169,0,133,185,-1234
1470 DATA 169,1,133,199,169,0,133,198,-1002
1480 DATA 133,157,160,16,177,251,133,183,-1210
1490 DATA 165,251,133,187,165,252,133,188,-1474
1500 DATA 160,19,169,1,145,251,32,210,-987
1510 DATA 38,147,5,76,79,65,68,73,-551
1520 DATA 78,71,32,156,0,32,183,45,-597
1530 DATA 169,0,166,45,164,46,32,34,-656
1540 DATA 36,96,32,52,36,169,255,133,-809
1550 DATA 3,169,213,133,4,32,205,2,-761
1560 DATA 32,67,36,96,133,6,134,7,-511
1570 DATA 132,8,8,104,133,5,169,0,-559
1580 DATA 133,2,96,165,5,72,165,6,-644
1590 DATA 166,7,164,8,40,96,32,127,-640
1600 DATA 41,32,210,38,147,144,13,13,-638
1610 DATA 13,82,69,78,85,77,66,69,-539
1620 DATA 82,0,32,169,36,32,210,38,-599
1630 DATA 44,49,19,0,169,152,141,253,-827
1640 DATA 3,169,36,141,254,3,162,5,-773
1650 DATA 169,13,157,74,3,202,16,250,-884
1660 DATA 169,6,133,208,169,3,133,4,-825
1670 DATA 169,64,133,3,169,0,133,2,-673
1680 DATA 169,0,141,255,3,76,227,2,-873
1690 DATA 32,219,41,169,158,32,251,38,-940
1700 DATA 224,128,56,208,1,24,76,93,-810
1710 DATA 33,72,152,72,138,72,169,0,-708
1720 DATA 141,22,37,173,3,31,141,13,-561
1730 DATA 31,173,4,31,141,14,31,162,-587
1740 DATA 8,169,0,141,21,37,173,13,-562
1750 DATA 31,56,253,12,37,141,15,31,-576
1760 DATA 173,14,31,253,11,37,141,16,-676
1770 DATA 31,144,18,238,21,37,173,15,-677
1780 DATA 31,141,13,31,173,16,31,141,-577
1790 DATA 14,31,76,198,36,173,21,37,-586
1800 DATA 13,22,37,141,22,37,240,9,-521
1810 DATA 173,21,37,24,105,48,32,251,-691
1820 DATA 38,202,202,16,188,104,170,104,-1024
1830 DATA 168,104,96,0,1,0,10,0,-379
1840 DATA 100,3,232,39,16,255,0,72,-717
1850 DATA 152,72,169,0,141,141,37,141,-853
1860 DATA 142,37,173,0,31,141,137,37,-698
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1870 DATA 173,1,31,141,138,37,17
3,137,-831
1880 DATA 37,24,105,4,141,139,37
,173,-660
1890 DATA 138,37,105,0,141,140,3
7,160,-758
1900 DATA 0,32,143,37,240,6,32,1
28,-618
1910 DATA 37,76,65,37,32,128,37,
173,-585
1920 DATA 139,37,32,173,37,173,1
40,37,-768
1930 DATA 200,32,173,37,136,238,
141,37,-994
1940 DATA 208,3,238,142,37,173,1
39,37,-977
1950 DATA 141,137,37,173,140,37,
141,138,-944
1960 DATA 37,32,143,37,208,184,2
00,32,-873
1970 DATA 143,37,208,178,104,168
,104,96,-1038
1980 DATA 238,139,37,208,3,238,1
40,37,-1040
1990 DATA 96,255,0,255,0,255,0,1
73,-1034
2000 DATA 139,37,133,253,173,140
,37,133,-1045
2010 DATA 254,142,18,31,174,23,3
1,169,-842
2020 DATA 253,141,170,2,32,162,2
,174,-936
2030 DATA 18,31,72,104,96,142,18
,31,-512
2040 DATA 174,137,37,134,253,174
,138,37,-1084
2050 DATA 134,254,162,253,142,18
5,2,174,-1306
2060 DATA 23,31,32,175,2,174,18,
31,-486
2070 DATA 96,160,0,162,1,189,129
,31,-768
2080 DATA 32,128,38,201,16,176,2
9,10,-630
2090 DATA 10,10,10,157,0,31,200,
185,-603
2100 DATA 129,31,32,128,38,201,1
6,176,-751
2110 DATA 11,24,125,0,31,157,0,3
1,-379
2120 DATA 200,202,16,217,96,169,
32,141,-1073
2130 DATA 137,37,169,208,141,138
,37,169,-1036
2140 DATA 0,141,23,31,141,24,31,
160,-551
2150 DATA 0,169,0,32,173,37,200,
32,-643
2160 DATA 173,37,169,63,141,23,3
1,32,-669
2170 DATA 139,38,169,14,32,251,3
8,160,-841
2180 DATA 59,169,0,141,137,37,14
1,0,-684
2190 DATA 3,169,19,141,138,37,14
1,1,-649
2200 DATA 3,185,68,38,32,173,37,
136,-672
2210 DATA 16,247,162,0,142,4,31,
232,-834
2220 DATA 142,3,31,96,173,255,3,
240,-943
2230 DATA 34,173,253,3,133,4,173
,254,-1027
2240 DATA 3,133,3,169,127,133,2,
134,-704
2250 DATA 7,169,127,141,222,2,16
9,44,-881
2260 DATA 141,239,2,169,142,141,
242,2,-1078
2270 DATA 76,227,2,238,255,3,169
,0,-970
2280 DATA 141,222,2,169,32,141,2
39,2,-948
2290 DATA 169,141,141,242,2,76,6,
3,77,-911
2300 DATA 56,233,48,201,10,144,3
,56,-751
2310 DATA 233,7,96,169,127,141,2
22,2,-997
2320 DATA 169,44,141,239,2,169,1
42,141,-1047
2330 DATA 242,2,96,169,0,141,222
,2,-874
2340 DATA 169,32,141,239,2,169,1
41,141,-1034
2350 DATA 242,2,96,160,0,32,192,
38,-762
2360 DATA 201,13,240,7,153,129,3
1,200,-974
2370 DATA 76,173,38,152,141,128,
31,96,-835
2380 DATA 32,52,36,169,255,133,3
,169,-849
2390 DATA 207,133,4,32,205,2,32,
67,-682
2400 DATA 36,96,72,138,72,152,72
,160,-798
2410 DATA 0,186,254,4,1,208,3,25
4,-910
2420 DATA 5,1,189,4,1,133,206,18
9,-728
2430 DATA 5,1,133,207,177,206,24
0,5,-974
2440 DATA 32,251,38,144,229,104,
168,104,-1070
2450 DATA 170,104,96,32,52,36,16
9,255,-914
2460 DATA 133,3,169,210,133,4,32
,205,-889
2470 DATA 2,32,67,36,96,72,165.2
51,-721
2480 DATA 24,105,21,133,251,165,
252,105,-1056
2490 DATA 0,133,252,104,96,72,16
9,0,-826
2500 DATA 133,251,169,64,133,252
,104,96,-1202
2510 DATA 206,139,37,173,139,37,
201,255,-1187
2520 DATA 208,3,206,140,37,96,16
0,0,-850
2530 DATA 140,8,31,173,7,31,240,
56,-686
2540 DATA 160,3,32,143,37,141,5,
31,-552
2550 DATA 200,32,143,37,141,6,31
,173,-763
2560 DATA 139,37,24,105,4,141,9,
31,-490
2570 DATA 173,140,37,105,0,141,1
0,31,-637
2580 DATA 160,0,173,139,37,24,10
5,4,-642
2590 DATA 141,139,37,173,140,37,
105,0,-772
2600 DATA 141,140,37,169,0,141,7
,31,-666
2610 DATA 32,70,35,240,25,201,34
,208,-845
2620 DATA 11,173,8,31,73,255,141
,8,-700
2630 DATA 31,76,120,39,174,8,31,
208,-687
2640 DATA 231,201,128,144,227,96
,169,1,-1197
2650 DATA 141,7,31,200,32,143,37
,208,-799
2660 DATA 149,200,32,143,37,208,
143,96,-1008
2670 DATA 32,210,38,147,13,13,13
,0,-466
2680 DATA 169,0,141,8,31,173,9,3
1,-562
2690 DATA 141,139,37,173,10,31,1
41,140,-812
2700 DATA 37,173,5,31,141,3,31,1
73,-594
2710 DATA 6,31,141,4,31,32,169,3
6,-450
2720 DATA 169,32,32,251,38,76,10
5,40,-743
2730 DATA 32,142,40,174,20,31,24
0,3,-682
2740 DATA 76,105,40,32,62,41,173
,139,-668
2750 DATA 37,141,21,31,173,140,3
7,141,-721
2760 DATA 22,31,176,3,76,105,40,
32,-485
2770 DATA 70,35,208,3,76,138,45,
201,-776
2780 DATA 32,240,244,201,34,240,
15,173,-1179
2790 DATA 21,31,141,139,37,173,2
2,31,-595
2800 DATA 141,140,37,76,105,40,3
2,187,-758
2810 DATA 35,224,0,208,3,76,206,
44,-796
2820 DATA 224,17,144,3,76,248,44
,32,-788
2830 DATA 148,35,176,3,76,86,45,
160,-729
2840 DATA 17,177,251,141,3,31,20
0,177,-997
2850 DATA 251,141,4,31,169,32,32
,251,-911
2860 DATA 38,32,169,36,160,0,173
,7,-615
2870 DATA 31,208,19,32,70,35,240
,14,-649
2880 DATA 201,32,240,242,201,44,
208,22,-1190
2890 DATA 32,251,38,76,247,39,16
9,13,-865
2900 DATA 32,251,38,169,1,141,7,
31,-670
2910 DATA 96,32,70,35,240,240,20
1,34,-948
2920 DATA 208,10,72,173,8,31,73,
255,-830
2930 DATA 141,8,31,104,174,8,31,
208,-705
2940 DATA 7,201,128,144,3,76,216
,39,-814
2950 DATA 32,251,38,76,105,40,14
1,11,-694
2960 DATA 31,72,152,72,138,72,17
3,11,-721
2970 DATA 31,201,254,240,97,201,
206,240,-1470
2980 DATA 115,201,255,208,5,169,
126,76,-1155
2990 DATA 245,40,56,233,128,141,
11,31,-885
3000 DATA 169,23,133,253,169,68,
133,254,-1202
3010 DATA 169,253,141,170,2,169,
0,141,-1045
3020 DATA 12,31,173,12,31,205,11
,31,-506
3030 DATA 240,20,162,0,160,0,32,
162,-776
3040 DATA 2,32,47,41,201,128,144
,242,-837
3050 DATA 238,12,31,76,194,40,16
2,0,-753
3060 DATA 160,0,32,162,2,32,47,4
1,-476
3070 DATA 201,128,176,6,32,251,3
8,76,-908
3080 DATA 222,40,56,233,128,32,2
51,38,-1000
3090 DATA 104,170,104,168,104,96
,32,54,-832
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3100 DATA 41,141,11,31,206,11,31,206,-678
3110 DATA 11,31,169,8,133,253,169,70,-844
3120 DATA 133,254,208,164,32,54,41,141,-1027
3130 DATA 11,31,206,11,31,206,11,31,-538
3140 DATA 169,200,133,253,169,70,133,254,-1381
3150 DATA 208,142,169,126,76,245,40,230,-1236
3160 DATA 253,208,2,230,254,96,160,1,-1204
3170 DATA 32,143,37,160,0,96,201,254,-923
3180 DATA 240,27,201,206,240,31,162,0,-1107
3190 DATA 221,84,48,240,14,72,189,84,-952
3200 DATA 48,240,5,104,232,76,72,41,-818
3210 DATA 104,24,96,56,96,162,20,32,-590
3220 DATA 70,35,76,72,41,162,40,76,-572
3230 DATA 95,41,72,152,72,138,72,162,-804
3240 DATA 0,160,0,136,208,253,202,208,-1167
3250 DATA 248,104,170,104,168,104,96,120,-1114
3260 DATA 72,152,72,138,72,173,137,37,-853
3270 DATA 72,173,138,37,72,173,139,37,-841
3280 DATA 72,173,140,37,72,169,17,141,-821
3290 DATA 139,37,141,137,37,169,208,141,-1009
3300 DATA 140,37,141,138,37,160,0,140,-793
3310 DATA 23,31,32,143,37,41,239,32,-578
3320 DATA 173,37,160,31,32,143,37,9,-622
3330 DATA 1,32,173,37,169,63,141,23,-639
3340 DATA 31,104,141,140,37,104,141,139,-837
3350 DATA 37,104,141,138,37,104,141,137,-839
3360 DATA 37,104,170,104,168,104,32,106,-825
3370 DATA 41,88,96,120,72,152,72,138,-779
3380 DATA 72,173,137,37,72,173,138,37,-839
3390 DATA 72,173,139,37,72,173,140,37,-843
3400 DATA 72,169,17,141,139,37,141,137,-853
3410 DATA 37,169,208,141,140,37,141,138,-1011
3420 DATA 37,160,31,169,0,141,23,31,-592
3430 DATA 32,143,37,41,254,32,173,37,-749
3440 DATA 160,0,32,143,37,9,16,32,-429
3450 DATA 173,37,169,63,141,23,31,104,-741
3460 DATA 141,140,37,104,141,139,37,104,-843
3470 DATA 141,138,37,104,141,137,37,104,-839
3480 DATA 170,104,168,104,32,106,41,88,-813
3490 DATA 96,224,38,208,67,32,210,38,-913
3500 DATA 147,13,13,129,79,86,69,82,-618
3510 DATA 32,54,53,53,51,53,32,76,-404
3520 DATA 73,78,69,83,32,73,78,32,-518
3530 DATA 67,79,77,80,76,69,84,69,-601
3540 DATA 32,80,82,79,71,82,65,77,-568
3550 DATA 46,13,85,78,65,66,76,69,-498
3560 DATA 32,84,79,32,67,79,78,84,-535
3570 DATA 73,78,85,69,0,76,21,35,-437
3580 DATA 224,39,208,96,32,210,38,147,-994
3590 DATA 13,13,129,76,73,78,69,32,-483
3600 DATA 78,85,77,66,69,82,32,154,-643
3610 DATA 0,165,59,141,3,31,165,60,-624
3620 DATA 141,4,31,32,169,36,32,210,-655
3630 DATA 38,32,129,73,78,32,77,79,-538
3640 DATA 68,85,76,69,32,39,32,154,-555
3650 DATA 0,32,183,45,32,210,38,32,-572
3660 DATA 129,39,13,67,79,78,84,65,-554
3670 DATA 73,78,83,32,85,78,82,69,-580
3680 DATA 83,79,76,86,69,68,32,82,-575
3690 DATA 69.70.69,82,69,78,67,69,-573
3700 DATA 0,76,21,35,32,210,38,13,-425
3710 DATA 13,129,193,78,32,85,78,75,-683
3720 DATA 78,79,87,78,32,69,82,82,-587
3730 DATA 79,82,32,72,65,83,32,79,-524
3740 DATA 67,67,85,82,82,69,68,13,-533
3750 DATA 68,85,82,73,78,71,32,82,-571
3760 DATA 69,78,85,77,66,69,82,73,-599
3770 DATA 78,71,32,79,82,32,84,82,-540
3780 DATA 89,73,78,71,32,84,79,82,-588
3790 DATA 69,80,76,65,67,69,13,65,-504
3800 DATA 32,76,73,78,69,46,0,76,-450
3810 DATA 21,35,224,23,208,52,32,210,-805
3820 DATA 38,147,13,13,129,85,78,65,-568
3830 DATA 66,76,69,32,84,79,32,85,-523
3840 DATA 80,68,65,84,69,32,70,79,-547
3850 DATA 76,76,79,87,73,78,71,32,-572
3860 DATA 76,73,78,69,46,212,79,79,-712
3870 DATA 32,76,79,78,71,13,0,76,-425
3880 DATA 239,45,224,16,240,3,76,228,-1071
3890 DATA 42,32,210,38,147,13,13,129,-624
3900 DATA 85,78,65,66,76,69,32,84,-555
3910 DATA 79,32,85,80,68,65,84,69,-562
3920 DATA 32,76,73,78,69,83,32,68,-511
3930 DATA 85,69,32,84,79,32,76,65,-522
3940 DATA 67,75,32,79,70,13,77,69,-482
3950 DATA 77,79,82,89,46,0,76,21,-470
3960 DATA 35,201,16,208,3,76,149,44,-732
3970 DATA 201,4,240,55,201,5,240,117,-1063
3980 DATA 201,9,208,3,76,94,44,32,-667
3990 DATA 210,38,13,129,85,78,75,78,-706
4000 DATA 79,87,78,32,69,82,82,79,-588
4010 DATA 82,32,76,79,65,68,73,78,-553
4020 DATA 71,32,39,32,154,0,32,183,-543
4030 DATA 45,32,210,38,32,129,39,0,-525
4040 DATA 76,21,35,32,210,38,13,129,-554
4050 DATA 70,73,76,69,32,39,32,154,-545
4060 DATA 0,32,183,45,32,210,38,32,-572
4070 DATA 129,39,13,79,78,32,68,69,-507
4080 DATA 86,73,67,69,32,39,32,154,-552
4090 DATA 0,32,210,45,32,210,38,32,-599
4100 DATA 129,39,32,68,79,69,83,32,-531
4110 DATA 78,79,84,32,69,88,73,83,-586
4120 DATA 84,0,76,21,35,32,210,38,-496
4130 DATA 13,129,68,69,86,73,67,69,-574
4140 DATA 32,39,32,154,0,32,210,45,-544
4150 DATA 32,210,38,32,129,39,32,78,-590
4160 DATA 79,84,32,80,82,69,83,69,-578
4170 DATA 78,84,0,76,21,35,32,210,-536
4180 DATA 38,13,129,68,69,86,73,67,-543
4190 DATA 69,32,39,32,154,0,32,210,-568
4200 DATA 45,32,210,38,32,129,39,32,-557
4210 DATA 72,65,83,32,73,76,76,69,-546
4220 DATA 71,65,76,32,68,69,86,73,-540
4230 DATA 67,69,32,78,85,77,66,69,-543
4240 DATA 82,0,76,21,35,32,52,36,-334
4250 DATA 169,245,133,3,169,181,133,4,-1037
4260 DATA 32,205,2,32,67,36,32,210,-616
4270 DATA 38,13,129,78,79,32,77,69,-515
4280 DATA 77,79,82,89,32,84,79,32,-554
4290 DATA 76,79,65,68,32,39,32,154,-545
4300 DATA 0,32,183,45,32,210,38,32,-572
4310 DATA 129,39,0,76,21,35,32,210,-542
4320 DATA 38,147,13,129,206,79,32,76,-720
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4330 DATA 65,66,69,76,32,68,69,7
0,-515
4340 DATA 73,78,69,68,32,73,78,3
2,-503
4350 DATA 76,73,78,69,32,66,69,7
6,-539
4360 DATA 79,87,13,13,0,76,239,4
5,-552
4370 DATA 32,210,38,147,13,129,7
6,65,-710
4380 DATA 66,69,76,32,84,79,79,3
2,-517
4390 DATA 76,65,82,71,69,32,40,3
2,-467
4400 DATA 62,49,54,32,41,32,73,7
8,-421
4410 DATA 32,76,73,78,69,32,66,6
9,-495
4420 DATA 76,79,87,13,13,0,76,23
9,-583
4430 DATA 45,32,210,38,147,13,12
9,204,-818
4440 DATA 65,66,69,76,32,39,32,1
54,-533
4450 DATA 0,32,183,45,32,210,38,
32,-572
4460 DATA 129,39,32,65,76,82,69,
65,-557
4470 DATA 68,89,32,68,69,70,73,7
8,-547
4480 DATA 69,68,0,76,239,45,32,2
10,-739
4490 DATA 38,147,13,129,204,65,6
6,69,-731
4500 DATA 76,32,39,32,154,0,160,
0,-493
4510 DATA 185,129,31,32,251,38,2
00,204,-1070
4520 DATA 128,31,208,244,32,210,
38,32,-923
4530 DATA 129,39,32,78,79,84,32,
68,-541
4540 DATA 69,70,73,78,69,68,0,76
,-503
4550 DATA 239,45,32,210,38,147,1
3,129,-853
4560 DATA 206,79,32,76,73,78,69,
32,-645
4570 DATA 78,85,77,66,69,82,44,3
2,-533
4580 DATA 76,65,66,69,76,44,32,7
9,-507
4590 DATA 82,32,83,84,65,84,69,7
7,-576
4600 DATA 69,78,84,0,76,239,45,7
2,-663
4610 DATA 152,72,160,16,177,251,
141,19,-988
4620 DATA 31,160,0,177,251,32,25
1,38,-940
4630 DATA 200,204,19,31,208,245,
104,168,-1179
4640 DATA 104,96,162,0,160,20,18
9,64,-795
4650 DATA 48,240,15,209,251,240,
4,232,-1239
4660 DATA 76,214,45,189,63,48,32
,251,-918
4670 DATA 38,96,169,63,76,230,45
,32,-749
4680 DATA 210,38,13,13,158,0,169
,1,-602
4690 DATA 141,20,31,32,176,39,76
,21,-536
4700 DATA 35,32,178,46,32,219,41
,32,-615
4710 DATA 29,39,32,210,38,76,65,
66,-555
4720 DATA 69,76,32,78,65,77,69,3
2,-498
4730 DATA 32,32,32,32,32,32,32,3
2,-256
4740 DATA 84,89,80,69,32,32,32,3
2,-450
4750 DATA 32,76,73,78,69,32,78,7
9,-517
4760 DATA 46,13,45,45,45,45,45,4
5,-329
4770 DATA 45,45,45,45,32,32,32,3
2,-308
4780 DATA 32,32,32,32,32,45,45,4
5,-295
4790 DATA 45,32,32,32,32,32,45,4
5,-295
4800 DATA 45,45,45,45,45,45,13,0
,-283
4810 DATA 32,183,45,160,16,169,1
8,56,-679
4820 DATA 241,251,170,169,32,32,
251,38,-1184
4830 DATA 202,16,250,160,19,177,
251,240,-1315
4840 DATA 12,32,210,38,69,88,84,
82,-615
4850 DATA 78,0,76,134,46,32,210,
38,-614
4860 DATA 73,78,84,82,78,0,162,5
,-562
4870 DATA 169,32,32,251,38,202,1
6,250,-990
4880 DATA 160,17,177,251,141,3,3
1,200,-980
4890 DATA 177,251,141,4,31,32,16
9,36,-841
4900 DATA 169,13,32,251,38,32,13
,39,-587
4910 DATA 160,0,177,251,208,170,
32,1,-999
4920 DATA 47,96,169,147,32,251,3
8,173,-953
4930 DATA 24,31,240,56,169,4,133
,186,-843
4940 DATA 169,7,133,185,169,4,13
3,184,-984
4950 DATA 169,0,133,183,32,52,36
,169,-774
4960 DATA 255,133,3,169,192,133,
4,32,-921
4970 DATA 205,2,32,67,36,176,22,
162,-702
4980 DATA 4,169,255,133,3,169,20
1,133,-1067
4990 DATA 4,32,52,36,32,205,2,32
,-395
5000 DATA 67,36,176,7,96,169,0,1
41,-692
5010 DATA 24,31,96,169,1,141,24,
31,-517
5020 DATA 96,173,24,31,240,238,2
01,1,-1004
5030 DATA 240,22,169,13,32,251,3
8,169,-934
5040 DATA 255,133,3,169,204,133,
4,32,-933
5050 DATA 52,36,32,205,2,32,67,3
6,-462
5060 DATA 169,255,133,3,169,195,
133,4,-1061
5070 DATA 169,4,32,52,36,32,205,
2,-532
5080 DATA 32,67,36,96,72,138,72,
152,-665
5090 DATA 72,173,139,37,72,173,1
40,37,-843
5100 DATA 72,173,7,31,72,32,54,3
9,-480
5110 DATA 240,22,201,143,240,247
,104,141,-1338
5120 DATA 7,31,104,141,140,37,10
4,141,-705
5130 DATA 139,37,104,168,104,170
,104,96,-922
5140 DATA 32,210,38,147,13,129,2
06,79,-854
5150 DATA 32,83,84,65,84,69,77,6
9,-563
5160 DATA 78,84,83,32,65,70,84,6
9,-565
5170 DATA 82,32,39,32,0,32,183,4
5,-445
5180 DATA 32,210,38,32,39,0,76,2
1,-448
5190 DATA 35,173,128,31,201,19,1
76,41,-804
5200 DATA 173,130,31,201,58,240,
77,173,-1083
5210 DATA 128,31,201,17,176,27,1
69,8,-757
5220 DATA 160,20,145,251,172,128
,31,136,-1043
5230 DATA 185,129,31,145,251,136
,16,248,-1141
5240 DATA 173,128,31,160,16,145,
251,24,-928
5250 DATA 96,32,210,38,13,150,70
,73,-682
5260 DATA 76,69,78,65,77,69,32,8
4,-550
5270 DATA 79,79,32,76,79,78,71,4
4,-538
5280 DATA 32,80,76,69,65,83,69,3
2,-506
5290 DATA 82,69,45,69,78,84,69,8
2,-578
5300 DATA 13,0,56,96,162,0,189,6
3,-579
5310 DATA 48,240,10,205,129,31,2
40,45,-948
5320 DATA 232,232,76,230,47,32,2
10,38,-1097
5330 DATA 13,150,68,69,86,73,67,
69,-595
5340 DATA 32,85,78,75,78,79,87,7
8,-592
5350 DATA 44,32,80,76,69,65,83,6
9,-518
5360 DATA 32,82,69,45,69,78,84,6
9,-528
5370 DATA 82,13,0,56,96,232,189,
63,-731
5380 DATA 48,160,20,145,251,172,
128,31,-955
5390 DATA 136,136,136,185,131,31
,145,251,-1151
5400 DATA 136,16,248,173,128,31,
56,233,-1021
5410 DATA 2,160,16,145,251,24,96
,65,-759
5420 DATA 8,66,9,67,10,68,11,84,
-323
5430 DATA 1,0,0,0,0,0,0,0,-1
5440 DATA 0,0,0,0,137,141,167,14
0,-585
5450 DATA 213,214,215,0,0,0,0,0,
-642
5460 DATA 0,0,0,0,0,0,0,0, 0
5470 DATA 0,0,0,0,0,0,0,0, 0
5480 DATA 0,0,0,0,0,0,0,0, 0
5490 DATA 0,0,0,0,0,0,0,0, 0
5500 DATA 0,0,0,0,0,0,0,0, 0
5510 DATA 0,0,0,0,0,0,0,0, 0
```

PROGRAM: BOOT.UTIL

```
10 POKE DEC("2E"),DEC("40")
20 BANK0
30 POKE DEC("4000"),0
40 POKE DEC("1211"),DEC("40")
50 RUN "LABEL-UTILITY"
```

PROGRAM: TXTCNTL.MOD

```
10 POKE DEC("2E"),DEC("40")
20 BANK0
30 POKE DEC("4000"),0
40 POKE DEC("1211"),DEC("40")
50 RUN "LABEL-UTILITY"
```

PROGRAM: TXTCNTL.MOD

```
10 REM THIS IS A PANEL CONTROL U
TILITY
20 REM $"PANEL INIT"
30 CD$="[cursor down x24]"
40 CU$="[cursor up x24]"
50 LF$="[cursor left]"
60 RG$="[cursor right]"
70 RETURN
80 REM
90 REM THIS IS A TEXT DISPLAY FO
R INPUT
100 LN HAS THE CHARACTER LIMIT
110 XP AND YP HAVE THE POSITION
FOR TT$
120 TT$ HAS THE TEXT TO BE DISPL
AYED
130 REM INPUT IS AFTER THE TEXT
140 REM $"GET TEXT"
150 GOSUB "POSITION"
160 PRINT TT$;
170 IF RA=1 THEN BEGIN
180 : FOR L1=1 TO LN
190 :    PRINT" ";
200 : NEXT
210 : PRINTLEFT$(RG$,LN);
220 BEND
230 LK=0   : REM NO. OF KEYS PRES
SED
240 IN$=""
250 DO
260 : GETKEY KY$
270 IF KY$=CHR$(13) THEN "EXIT2"
280 : IF KY$=CHR$(20) THEN BEGIN
290 :    IF LK>0 THEN BEGIN
300 :       LK=LK-1:PRINT"";" ";"
";
310 :       IN$=LEFT$(IN$,LK)
320 :    BEND
330 : BEND:ELSE BEGIN
340 :    IF LK<LN THEN BEGIN
350 :       PRINTKY$;
360 :       IN$=IN$+KY$
370 :       LK=LK+1
380 :    BEND
390 : BEND
400 LOOP UNTIL KY$=CHR$(13)
410 REM $"EXIT2"
420 RETURN
430 REM DISPLAY TEXT AT POSITION
 DEFINED
440 REM $"DISPTEXT"
450 GOSUB "POSITION"
460 PRINT TT$;
470 RETURN
480 REM
490 REM POSITION CURSOR
500 REM $"POSITION"
510 PRINT"";LEFT$(CD$,YP);LEFT$
(LF$,XP);
520 RETURN
```

PROGRAM: UTIL.MAIN

```
10 IF PEEK(DEC("2E"))<64 THEN RU
N "BOOT.UTIL"
20 DIM B$(19)
30 GOSUB "PANEL INIT"
40 BANK0
50 BLOAD "LABEL-LINKER",B0
60 MO=0
70 PRINTCHR$(14);
80 DO
90 : COLOR 0,16
100 : COLOR 4,8
110 : COLOR 5,5
120 : PRINT "
"
130 : PRINT "
"
140 : PRINT ""
150 : COLOR 5,6
160 : PRINT "          1.     .PDATE
 EVICE TABLE"
170 : PRINT ""
180 : COLOR 5,7
190 : PRINT "          2.     .PDATE
 COMMAND TABLE - $FE"
200 : PRINT""
210 : PRINT "          3.     .PDATE
 COMMAND TABLE - $CE"
220 : PRINT""
230 : COLOR 5,3
240 : PRINT "          .      ND UT
ILITY
250 : PRINT""
260 : COLOR 5,1
270 : PRINT "          SELECT OPTI
ON PLEASE"
280 : DO
290 :    GETKEY A$
300 : LOOP UNTIL A$="E" OR A$="1
" OR A$="2" OR A$="3"
310 : IF A$<>"E" THEN BEGIN
320 :    TP$="$FE":IF A$="3" THEN
A$="2":TP$="$CE"
330 :    ON ASC(A$)-48 GOSUB "UPD
ATE DEVICE","UPDATE COMMAND"
340 : BEND
350 LOOP UNTIL A$="E"
360 IF MO<>0 THEN BEGIN
370 : SCRATCH "OLDLINKER"
380 : RENAME "LABEL-LINKER" TO "
OLDLINKER"
390 : BSAVE "LABEL-LINKER",B0,P8
192 TO P12432
400 BEND
410 PRINT ""
420 END
```

PROGRAM: UPDATE DEVICE

```
10 PRINT "       PREFIX
  DEVICE NO."
20 PRINT "
"
30 LO=DEC("303F")
40 T=PEEK(LO)
50 CO=0
60 DO WHILE T<>0
70 : B$(CO)=CHR$(T)
80 : PRINT "            ";B$(CO);"
            ";PEEK(LO+CO*2+1
)
90 : CO=CO+1
100 : T=PEEK(LO+CO*2)
110 LOOP
120 EN=CO-1
130 DO
140 : GOSUB "GET INPUT1"
150 : IF PR$<>"" THEN BEGIN
160 :    CO=0:FD=0
170 :    DO WHILE CO<=EN AND FD=0
180 :       IF B$(CO)=PR$ THEN FD=
1:ELSE CO=CO+1
190 :    LOOP
200 :    IF CO=10 THEN YP=23:XP=1
0:TT$="TABLE IS FULL":GOSUB "DIS
PTEXT":ELSE BEGI
N
210 :       POKE (LO+CO*2),ASC(PR$
)
220 :       POKE (LO+CO*2+1),DV
230 :       IF FD=1 THEN BEGIN
240 :          XP=13:YP=23:TT$="ENT
RY CHANGED":GOSUB "DISPTEXT"
250 :       BEND:ELSE BEGIN
260 :          XP=16:YP=23:TT$="ENT
RY ADDED"
270 :          GOSUB "DISPTEXT"
280 :          EN=EN+1
290 :          B$(CO)=PR$
300 :       BEND
310 :       PRINT "";
320 :       PRINT LEFT$(CD$,CO);
330 :    PRINT "          ";B$(CO
);"            ";PEE
K(LO+CO*2+1)
340 :    BEND
350 :    SLEEP3
360 :    XP=5:YP=20:TT$="
                    "
370 :    GOSUB "DISPTEXT"
380 :    YP=21:GOSUB "DISPTEXT"
390 :    YP=23:GOSUB "DISPTEXT"
400 : BEND
410 MO=1
420 LOOP UNTIL PR$=""
430 RETURN
440 REM GET THE DATA
450 REM $"GET INPUT1"
460 LN=1:RA=1:XP=10:YP=20:TT$="D
EVICE : "
470 ED=1
480 DO
490 : GOSUB "GET TEXT"
500 : PR$=IN$
510 : IF PR$>="A" OR PR$<="Z" OR
 PR$=CHR$(13) THEN ED=0
520 LOOP UNTIL ED=0
530 IF PR$="" THEN "EXIT"
540 LN=3:RA=1:XP=9:YP=21:TT$="AD
DRESS : "
550 DO
560 : GOSUB "GET TEXT"
570 : DV=INT(VAL(IN$))
580 : IF DV<0 OR DV>255 THEN ED=
1:ELSE ED=0
590 LOOP UNTIL ED=0
600 REM $"EXIT"
610 RETURN
```

PROGRAM: UPDATE COMMAND

```
10 LM=20-1
20 PRINT "    FIRST TOKEN IS -
";TP$
30 PRINT "           TOKEN"
```

```
40 PRINT "                    ------"
50 IF TP$="$FE" THEN LO=DEC("306
8"):ELSE LO=DEC("307C")
60 T=PEEK(LO)
70 CO=0
80 DO WHILE T<>0
90 : B$(CO)=RIGHT$(HEX$(T),2)
100 : PRINT "                  ";B
$(CO)
110 : CO=CO+1
120 : T=PEEK(LO+CO)
130 LOOP
140 EN=CO-1
150 DO
160 : GOSUB "GET INPUT2"
170 : IF MO$<>"" THEN BEGIN
180 :    CO=0:FD=0
190 :    DO WHILE CO<=EN AND FD=0
200 :       IF B$(CO)=TK$ THEN FD=
1:ELSE CO=CO+1
210 :    LOOP
220 :    IF MO$="D" AND FD=0 THEN
 BEGIN
230 :       XP=10:YP=23:TT$="ENTRY
 DOESN'T EXIST"
240 :       GOSUB "DISPTEXT"
250 :    BEND:ELSE BEGIN
260 :       IF MO$="I" AND EN=LM T
HEN BEGIN
270 :          XP=10:YP=23:TT$="NO
MORE ROOM IN TABLE"
280 :          GOSUB "DISPTEXT
290 :       BEND:ELSE BEGIN
300 :          IF MO$="I" AND FD=1
THEN BEGIN
310 :             XP=10:YP=23:TT$="T
OKEN ALREADY EXISTS"
320 :             GOSUB "DISPTEXT"
330 BEND:ELSE BEGIN
340 :             MO=1
350 :             IF MO$="I" THEN BE
GIN
360 :               B$(CO)=TK$
370 :               EN=EN+1
380 :               PRINT"{CRSR}"
390 :               PRINTLEFT$(CD$,C
O);
400 :               PRINT "
       ";B$(CO);"  "
410 :               XP=15:YP=23:TT$=
"TOKEN INSERTED"
420 :               GOSUB "DISPTEXT"
430 :             BEND:ELSE BEGIN
440 :               REM DELETE ENTRY
450 :               PRINT"{CRSR}"
460 :               PRINTLEFT$(CD$,C
O);
470 :               FOR L1=CO TO EN-
1
480 :                 IF EN=0 THEN B
$(0)="  ":ELSE B$(L1)=B$(L1+1)
490 :                 PRINT "
       ";B$(L1);"  "
500 :               NEXT L1
510 :               PRINT "
       "
520 :               EN=EN-1
530 :               XP=15:YP=23:TT$=
"TOKEN DELETED"
540 :               GOSUB "DISPTEXT"
550 :             BEND
560 :          BEND
570 :       BEND
580 :    BEND
590 :    SLEEP3
600 : BEND
610 : XP=5:YP=20:TT$="
                          "
620 : GOSUB "DISPTEXT"
630 : YP=21:GOSUB "DISPTEXT"
640 : YP=23:GOSUB "DISPTEXT"
650 LOOP UNTIL MO$=""
660 FOR L1=0 TO EN:REM REPLACE D
ATA
670 : POKE LO+L1,DEC(B$(L1))
680 : NEXT L1
690 IF EN<LM THEN BEGIN
700 : FOR L1=EN+1 TO LM
710 :    POKE LO+L1,0:REM CLEAR O
THERS
720 : NEXT L1
730 BEND
740 RETURN
750 REM GET THE INPUT
760 REM $"GET INPUT2"
770 LN=1:RA=1:XP=10:YP=20:TT$="C
OMMAND : "
780 ED=1
790 DO
800 : GOSUB "GET TEXT"
810 : MO$=IN$
820 : IF MO$="D" OR MO$="I" OR M
O$="" THEN ED=0
830 LOOP UNTIL ED=0
840 IF MO$="" THEN "EXIT1"
850 LN=3:RA=1:XP=11:YP=21:TT$="T
OKEN : $"
860 DO
870 : GOSUB "GET TEXT"
880 : CH=DEC(IN$):TK$=RIGHT$(HEX
$(DEC(IN$)),2)
890 : IF CH<0 OR CH>255 THEN ED=
1:ELSE ED=0
900 LOOP UNTIL ED=0
910 REM $"EXIT1"
920 RETURN
```

PROGRAM: PRINT.MOD

```
10 REM THIS IS A PRINTER CONTROL
 MODULE
20 REM THE FOLLOWING VARIABLES A
RE
30 REM REQUIRED :-
40 REM           TP$()  - TYPES
50 REM           MO(,)  - CONTROL
 DATA
60 REM           CT$    - CONTROL
 CHARS
70 REM           LP,LO,L1 - LOOP
 INFO
80 REM           LM     - LEFT MA
RGIN
90 REM           RM     - RIGHT M
ARGIN
100 REM           LL    - LINE FE
ED
110 REM           PL    - PAGE LE
NGTH
120 REM          254,255 - LF'S
130 REM
140 REM
150 REM THIS IS THE INITIALISATI
ON
160 REM AND PRINTER DEFINITION S
ECTION
170 REM $"INIT PRINTER"
180 DIM TP$(10),MO(10,8)
190 EE=-1
200 IF TP$(1)="" THEN BEGIN
210 : RESTORE 470
220 : FOR LO=1 TO 10
230 :    READ TP$(LO)
240 :    FOR LP=1 TO 8
250 :       READ MO(LO,LP)
260 :    NEXT LP
270 : NEXT LO
280 BEND
290 OPEN 255,4
300 IF PL<>0 THEN BEGIN
310 : OPEN254,4,3
320 : PRINT#254,CHR$(PL)
330 : GOSUB "CHECK STATUS"
340 : CLOSE 254
350 BEND
360 IF LM<>0 AND EE=-1 THEN ST$=
CHR$(27)+CHR$(108)+CHR$(LM):GOSU
B "PRINTIT"
370 IF RM<>0 AND EE=-1 THEN ST$=
CHR$(27)+"Q"+CHR$(RM):GOSUB "PRI
NTIT"
380 IF LL<>0 AND EE=-1 THEN ST$=
CHR$(27);"+"+CHR$(LL)
390 IF LEN(CT$)<=2 AND EE=-1 THE
N BEGIN
400 IF MID$(CT$,1,1)="S" OR MID$
(CT$,2,1)="S" THEN ST$=CHR$(147)
:GOSUB "PRINTIT"
410 IF MID$(CT$,1,1)="T" OR MID$
(CT$,2,1)="I" THEN ST$=CHR$(19):
GOSUB "PRINTIT"
420 IF MID$(CT$,1,1)="U" OR MID$
(CT$,2,1)="U" THEN ST$=CHR$(27)+
"U1";:GOSUB "PRI
NTIT"
430 IF MID$(CT$,1,1)="B" OR MID$
(CT$,2,1)="B" THEN ST$=CHR$(27)+
"U0";:GOSUB "PRI
NTIT"
440 RETURN
450 REM CONTROL DATA FOR PRINTIN
G
460 REM $"PRINT DATA"
470 DATA"D",3,27,87,49,3,27,87,4
8       :REM DOUBLE WIDTH
480 DATA"L",1,17,0,0,1,145,0,0
        :REM LOWER CASE
490 DATA"I",2,27,52,0,2,27,53,0
        :REM ITALIC ON
500 DATA"-",3,27,45,1,3,27,45,0
        :REM UNDERLINE OFF
510 DATA"S",2,27,71,0,2,27,72,0
        :REM DOUBLE STRIKE
520 DATA"P",2,27,80,0,2,27,78,0
        :REM PICA PITCH
530 DATA"E",2,27,69,0,2,27,70,0
        :REM EMPHASISED
540 DATA"<",3,27,83,49,2,27,84,0
        :REM SUBSCRIPT
550 DATA">",3,27,83,0,2,27,84,0
        :REM SUPERSCRIPT
560 DATA"N",3,27,120,1,3,27,120,
0       :REM NLQ
570 REM CT$ HAS THE CONTROL CHAR
ACTERS
580 REM PR$ HAS THE TEXT TO BE P
RINTED
590 REM THIS IS FOR CBM MODE
600 REM
610 REM D - DOUBLE STRIKE
620 REM L - LOWER CASE
630 REM - - UNDERLINE
640 REM I - ITALIC
650 REM S - DOUBLE STRIKE
660 REM E - EMPHASISED
670 REM N - NLQ
680 REM P - PICA ( DEFAULT IS EL
ITE )
690 REM > - SUPERSCRIPT
700 REM < - SUBSRIPT
710 REM C - CONDENSED PRINT
720 EE=-1
730 REM $"DEFINE PRINT"
740 IF LEN(CT$)<=11 THEN BEGIN
750 : L1=1:DO WHILE L1<=LEN(CT$)
760 :    IF MID$(CT$,L1,1)="C" TH
EN OPEN254,4,13:PRINT#254:GOSUB
"CHECK STATUS":C
LOSE 13:ELSE BEGIN
```

```
770 :      LP=1:DO WHILE LP<=11 AND EE=-1
780 :        IF TP$(LP)=MID$(CT$,L1,1) THEN BEGIN
790 :          ST=""
800 :          LO=1:DO WHILE LO<=MO(LP,1) AND EE=-1
810 :            ST$=ST$+CHR$(MO(LP,LO+1))
820 :          LO=LO+1:LOOP
830 :          GOSUB "PRINTIT"
840 :        BEND
850 :      LP=LP+1:LOOP
860 :    BEND
870 : L1=L1+1:LOOP
880 BEND
890 RETURN
900 REM CLEAR PRINT MODES DEFINED BY
910 REM CT$
920 REM $"CLEAR PRINT"
930 EE=-1
940 IF LEN(CT$)<=11 THEN BEGIN
950 : L1=1:DO WHILE L1<=LEN(CT$) AND EE=-1
960 :    LP=1:DO WHILE LP<=11 AND EE=-1
970 :      IF TP$(LP)=MID$(CT$,L1,1) THEN BEGIN
980 :        LO=1:DO WHILE LO<=MO(LP,5) AND EE=-1
990 :        ST=""
1000 :          ST$=ST$+CHR$(MO(LP,LO+5))
1010 :        LO=LO+1:LOOP
1020 :        GOSUB "PRINTIT"
1030 :      BEND
1040 :    LP=LP+1:LOOP
1050 : L1=L1+1:LOOP
1060 BEND
1070 RETURN
1080 REM $"RESET PRINTER"
1090 OPEN 254,4,10
1100 PRINT#254
1110 GOSUB "CHECK STATUS"
1120 CLOSE 254
1130 ST$=CHR$(27)+CHR$(120)+CHR$(0) : REM NLQ OFF
1140 GOSUB "PRINTIT"
1150 RETURN
1160 REM
1170 REM THIS PRINTS A LINE IN ST$
1180 REM $"PRINTIT"
1190 PRINT#255,ST$
1200 IF ST=0 THEN PRINT#255
1210 GOSUB "CHECK STATUS"
1220 RETURN
1230 REM
1240 CHECK STATUS
1250 REM
1260 REM $"CHECK STATUS"
1270 IF ST<0 THEN EE=1
1280 RETURN
1290 REM
1300 REM SHUT PRINTER OFF
1310 REM $"PRINT OFF"
1320 CLOSE 255
1330 RETURN
```

PROGRAM: COMPACT.LOADER

```
10 BANK 0
20 COLOR 0,1:COLOR 4,1:COLOR 5,8
30 PRINT"□              COMPACT LOADER"
40 PRINT"              --------------"
50 PRINT "■■■■■           ADDRESS ==> $";
60 SA=28672
70 DO WHILE SA<29229 AND EE=0
80 : READ DT
90 : IF DT < 0 THEN BEGIN
100 :    IF ABS(DT) <> TT THEN EE=1:ELSETT=0
110 : BEND:ELSE BEGIN
120 :   POKE SA,DT:TT=TT+DT
130 :   PRINT HEX$(SA);"■■■■■";:SA=SA+1
140 :BEND
150 LOOP:PRINT
160 IF EE=1 THEN PRINT"■■■ERROR IN LINE ";PEEK(65)+PEEK(66)*256:ELSE BEGIN
170 : PRINT"■■SAVING COMPACT"
180 : BSAVE "COMPACT",B0,P28672 TO P29229
190 : PRINT "■■PROGRAM SAVED"
200 BEND
210 DATA 32,116,113,176,80,32,77,113,-739
220 DATA 169,1,141,57,114,162,3,32,-679
230 DATA 51,113,32,58,113,202,16,247,-832
240 DATA 32,51,113,201,0,208,7,32,-644
250 DATA 145,112,144,228,176,47,201,34,-1087
260 DATA 208,6,32,115,112,76,24,112,-685
270 DATA 201,32,208,6,32,91,112,76,-758
280 DATA 24,112,201,58,208,6,32,133,-774
290 DATA 112,76,24,112,201,143,208,7,-883
300 DATA 32,218,112,144,203,176,185,32,-1102
310 DATA 58,113,76,24,112,32,155,113,-683
320 DATA 76,0,2,174,59,114,208,10,-643
330 DATA 174,53,114,208,5,174,54,114,-896
340 DATA 208,3,32,58,113,169,0,141,-724
350 DATA 57,114,96,72,169,0,141,57,-706
360 DATA 114,173,53,114,73,255,141,53,-976
370 DATA 114,104,76,106,112,174,57,114,-857
380 DATA 240,224,174,54,114,240,219,208,-1473
390 DATA 220,32,58,113,169,1,141,57,-791
400 DATA 114,169,0,141,53,114,141,59,-791
410 DATA 114,173,49,114,133,251,173,50,-1057
420 DATA 114,133,252,160,0,173,47,114,-993
430 DATA 141,49,114,173,48,114,141,50,-830
440 DATA 114,200,32,243,113,136,173,49,-1060
450 DATA 114,32,243,113,160,0,32,206,-900
460 DATA 113,141,56,114,200,32,206,113,-975
470 DATA 136,13,56,114,208,2,56,96,-681
480 DATA 24,96,174,55,114,240,46,173,-922
490 DATA 57,114,208,51,173,47,114,141,-905
500 DATA 51,114,173,48,114,141,52,114,-807
510 DATA 32,31,114,32,230,113,240,9,-801
520 DATA 201,58,208,244,32,39,113,24,-919
530 DATA 96,173,51,114,141,47,114,173,-909
540 DATA 52,114,141,48,114,32,58,113,-672
550 DATA 169,1,141,59,114,24,96,162,-766
560 DATA 3,32,31,114,202,16,250,32,-680
570 DATA 39,113,32,255,113,56,96,32,-736
580 DATA 206,113,240,6,32,255,113,76,-1041
590 DATA 39,113,96,32,206,113,32,255,-886
600 DATA 113,96,72,173,47,114,133,251,-999
610 DATA 173,48,114,133,252,104,32,243,-1099
620 DATA 113,32,8,114,96,160,0,140,-663
630 DATA 53,114,140,59,114,165,45,141,-831
640 DATA 45,114,141,49,114,141,47,114,-765
650 DATA 165,46,141,46,114,141,50,114,-817
660 DATA 141,48,114,169,251,141,170,2,-1036
670 DATA 141,185,2,96,201,1,208,6,-840
680 DATA 141,54,114,76,131,113,169,0,-798
690 DATA 141,54,114,224,1,208,5,142,-889
700 DATA 55,114,24,96,162,0,142,55,-648
710 DATA 114,173,55,114,13,54,114,208,-845
720 DATA 241,56,96,169,0,32,58,113,-765
730 DATA 32,58,113,169,16,133,251,169,-941
740 DATA 18,133,252,160,0,173,47,114,-897
750 DATA 32,243,113,200,173,48,114,32,-955
760 DATA 243,113,162,7,189,198,113,157,-1182
770 DATA 0,2,202,16,247,96,169,0,-732
780 DATA 141,0,255,76,63,77,173,45,-830
790 DATA 114,133,251,173,46,114,133,252,-1216
800 DATA 142,58,114,162,63,32,162,2,-735
810 DATA 174,58,114,72,104,96,173,47,-838
820 DATA 114,133,251,173,48,114,133,252,-1218
830 DATA 76,216,113,142,58,114,162,63,-944
840 DATA 32,175,2,174,58,114,96,238,-889
850 DATA 45,114,208,3,238,46,114,96,-864
860 DATA 238,47,114,208,3,238,48,114,-1010
870 DATA 96,206,45,114,173,45,114,201,-994
880 DATA 255,208,3,206,46,114,96,206,-1134
890 DATA 47,114,173,47,114,201,255,208,-1159
900 DATA 3,206,48,114,96,-467
```

ARE YOU A COMMODORE EXPERT?

Your Commodore, the market-leading magazine for serious Commodore users, is looking for a technical assistant.

The job involves helping with the day to day running of the technical aspects of the magazine.

The successful applicant will be expected to help choose software for inclusion in the magazine as well as sort out reader's technical enquiries and write articles.

All applications, which will be treated in confidence, should be sent to:

Stuart Cooke, Editor, Your Commodore, ASP Ltd, Number One, Golden Square, London W1A 3RB

Closing date: 20th February 1988

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IS YOUR 128 GROWING UP OR GROWING OLD?

Scratch Software Club offers everything you need, we have a software database of all 128 software, detailed info and progs for CP/M, new hardware and software.
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Brampton, Croome Road, Defford, Worcs. WR8 9AR.

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Free membership. Wide selection. send 2 x 18p stamps for deatils.
To: Commodore Disk Library
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FOR CBM-64/128 & VIC 20

The **Mk.1. uses a second CBM type cassette deck to copy a program as it loads. Very easy to use.**
£8.95 inc. P&P
NEW IMPROVED Mk.2. has a built in speaker so you can hear your copy being made. Works like the Mk.1. or can be switched to use our 'GENERATOR' software method.
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DISCOUNT SOFTWARE: Latest titles for CBM64/128 at 75% off R.R.P.: S.A.E. To: A.O.W. 104 Hollywell Road, Lincoln. LN5 9BY.

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X RATED

ADULTS ONLY GAME
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Commodore 64/128 **£6.50**
inc p&p
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BS22 9AH

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Write your advert in BLOCK CAPITALS in the grid below, ticking the section you wish it to appear under, INCLUDING YOUR NAME AND ADDRESS IN THE WORD COUNT and send it to: **YOUR COMMODORE, ADVERTISEMENT DEPARTMENT, NO: 1 GOLDEN SQUARE, LONDON W1R 3AB.**
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I enclose my Cheque/Postal Order* for £........... for.......... insertions, made payable to Argus Specialist Publications.
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£................ for....... insertions ....

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Day-time Telephone No: ....
Signature .... Date ....

YOUR COMMODORE COPY DEADLINES IN 1988:-

MAY ISSUE - 15th FEBRUARY 1988

B R E A K

OOPS!

Unfortunately an error appeared in the program Lister 128 in the December issue.
The corrections are as follows:
Add the following to the end of lines 420 and 440.
:L=L+1
Apologies for the inconvenience caused.

Program Submissions

Due to the illness of our software evaluator some people may be experiencing a delay in getting to replies regarding submissions. We are trying to clear the backlog of programs as quickly as we can but this is taking some time. This backlog also effects Bug Finders and Lifesavers.

We apologise for the delay and would ask that you would bear with us while the backlog is cleared.

The publication of lifesavers has also been halted because of this software backlog. We will be bringing you more short programs and tips as soon as we can.

Commodore Where Are You?

At the *Your Commodore* office we are repeatedly asked for the address and telephone number of Commodore U.K. Many people, after referring to their computer manuals, believe them to be based in Corby.

The Commodore plant at Corby was closed down some time ago. Reproduced here you will find the correct address for Commodore U.K.

We suggest that you write this correct address in the front of your computers manual for future reference.

Commodore Business Machine, (UK),
Commodore House,
The Switchback,
Gardner Road,
Maidenhead,
Berks SL6 7XA.

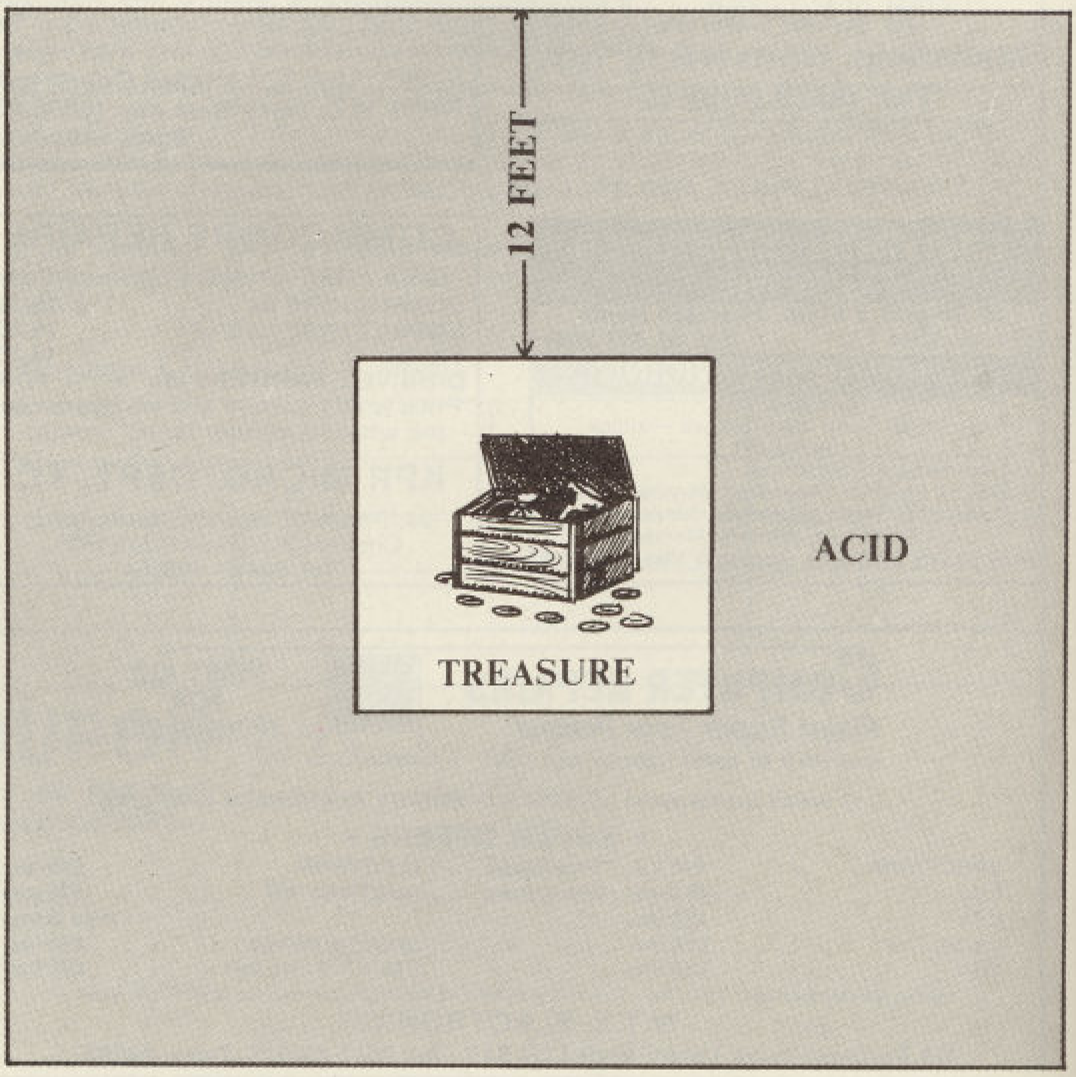
At the *Your Commodore* office we receive hundreds of letters from readers every month. We do try and answer each individually but sometimes this is impossible due to pressure of work. If you have written to us and not received a personal reply, we apologise for this but we cannot promise to reply to every item of mail we receive. If you feel that your question or letter really needs an answer, then inclusion of an s.a.e. will guarantee a reply, although this may still take time to arrive.

Puzzle Corner

After a series of adventures, you have made your way to the evil wizard's treasure room. All that remains is to make off with the loot!

The treasure is on an island in the centre of an acid filled pool. The distance between you and the island is twelve feet. All you can find to help you are two planks but unfortunately, they are both only ten feet long.

Can you still get the treasure and if so, how? Diagrams should be sent to: Your Commodore, Puzzle Corner, 1 Golden Square, London W1R 3AB.



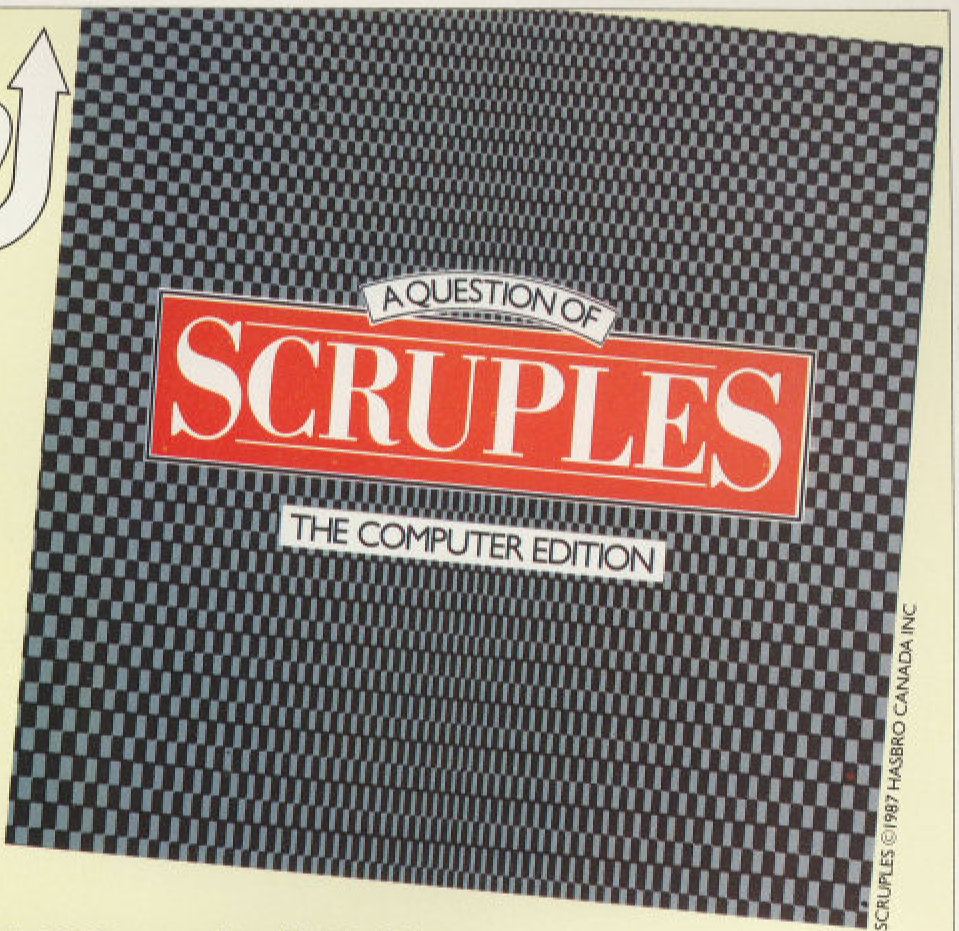
Scruples, an inventive and original computer game, is in the shops today. Do you rush out and sell a personal possession so you can buy it before pay-day?

Scruples computer game is available on Spectrum 48/128, +2, +3, Commodore 64/128, Amstrad CPC 464, 6128 and Atari ST. The computer you own is not one of these. Do you replace it immediately with one that runs Scruples?

Scruples makes such an excellent Christmas present, you buy one for your computer-mad niece. After one play you are completely hooked– do you keep it?

You are due to keep an important appointment that may affect your future career. Your spouse loads up Scruples and you get involved in a game. Do you keep the appointment?

An attractive colleague at work is becoming very attentive and asks you to dinner. You find out that not only do they dislike Scruples but they hate computers too. Do you accept their invitation?



YES? NO? ...DEPENDS.

Milton Bradley's compelling game is now available for computer. Anticipate your friend's responses to the provocative questions, in Scruples. Think carefully before answering the moral dilemma you are posed, or turn the tables and give an opposite reply to the one expected! Bluff and counter bluff will be needed, and beware, the other players (the Jury) can challenge your honesty at any time.

The computer interpretation is ingenious and funny. Up to ten people can play: all human, all computer, or any combination. There is a minimum of 64 characters to choose from, each with simulated 'intelligence'. Real players must 'adjust' their personalities and select their appearance from a gallery of faces provided. A minimum of 230 leading questions are built-in and no game will ever be the same.

Scruples, The Computer Edition, is available from all good software retailers or directly from Leisure Genius.

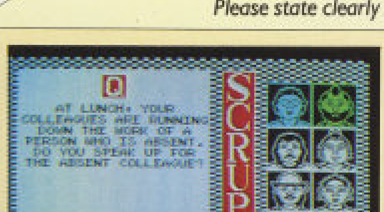
Spectrum 48/128/+2/+3	*cass* **£9.95**	*disc* **£14.95**
Commodore 64/128	*cass* **£12.95**	*disc* **£14.95**
Amstrad CPC	*cass* **£9.95**	*disc* **£14.95**
Atari ST	–	*disc* **£19.95**

Please state clearly machine type and media required.

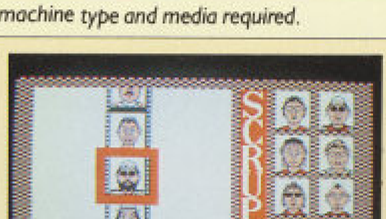
Make cheques or postal orders payable to Virgin Games Ltd and send to 2/4 Vernon Yard, Portobello Road, London W11 2DX. DO NOT POST NOTES OR COINS!

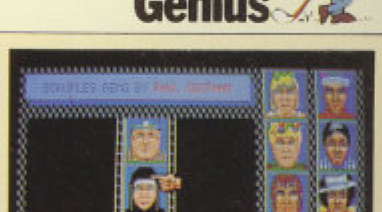
Leisure Genius®


COMMODORE SCREEN



SPECTRUM SCREEN

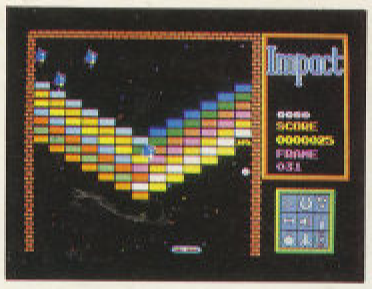

AMSTRAD SCREEN

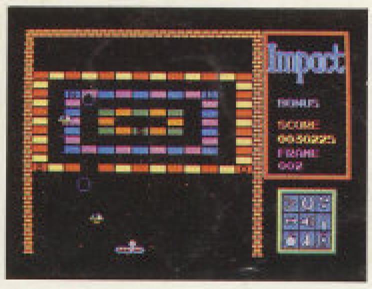

ATARI SCREEN

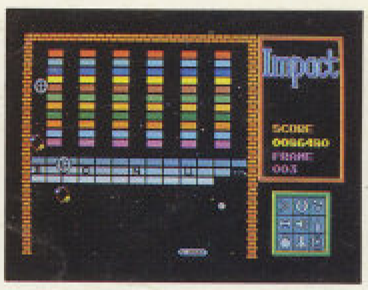


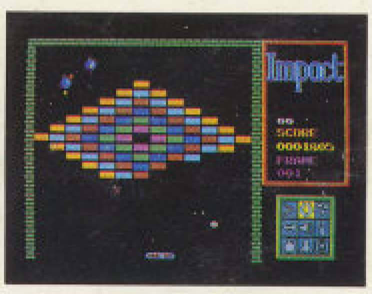
It plays like a dream... but seems like a NIGHTMARE!

TRAPPED – in a 1970's arcade machine! Every escape route is blocked by a wall of brightly coloured bricks. Powerfully addictive, with 200k of digitized sound, **IMPACT** has 80 built in screens plus 48 that you can design yourself – as hard, as simple, as much fun as you like. Hidden on each screen are special tokens – catch them if you can. Use them to buy one of nine powerful weapons, or keep them until the end of the screen to score a bonus.







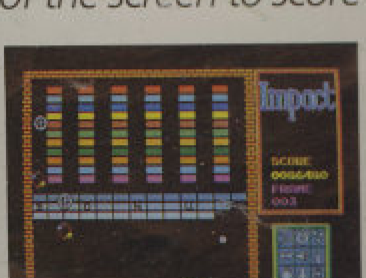


Available now, price £14.95 for Amiga (512k min.) and Atari ST (requires 512k, mouse and colour monitor or TV).
Now released for CBM64, Spectrum and BBC (specifications vary).
Audiogenic Software ltd., Winchester House, Canning Road, Wealdstone, Harrow, Middlesex HA3 7SJ.

Tel: 01-861 1166

ASL



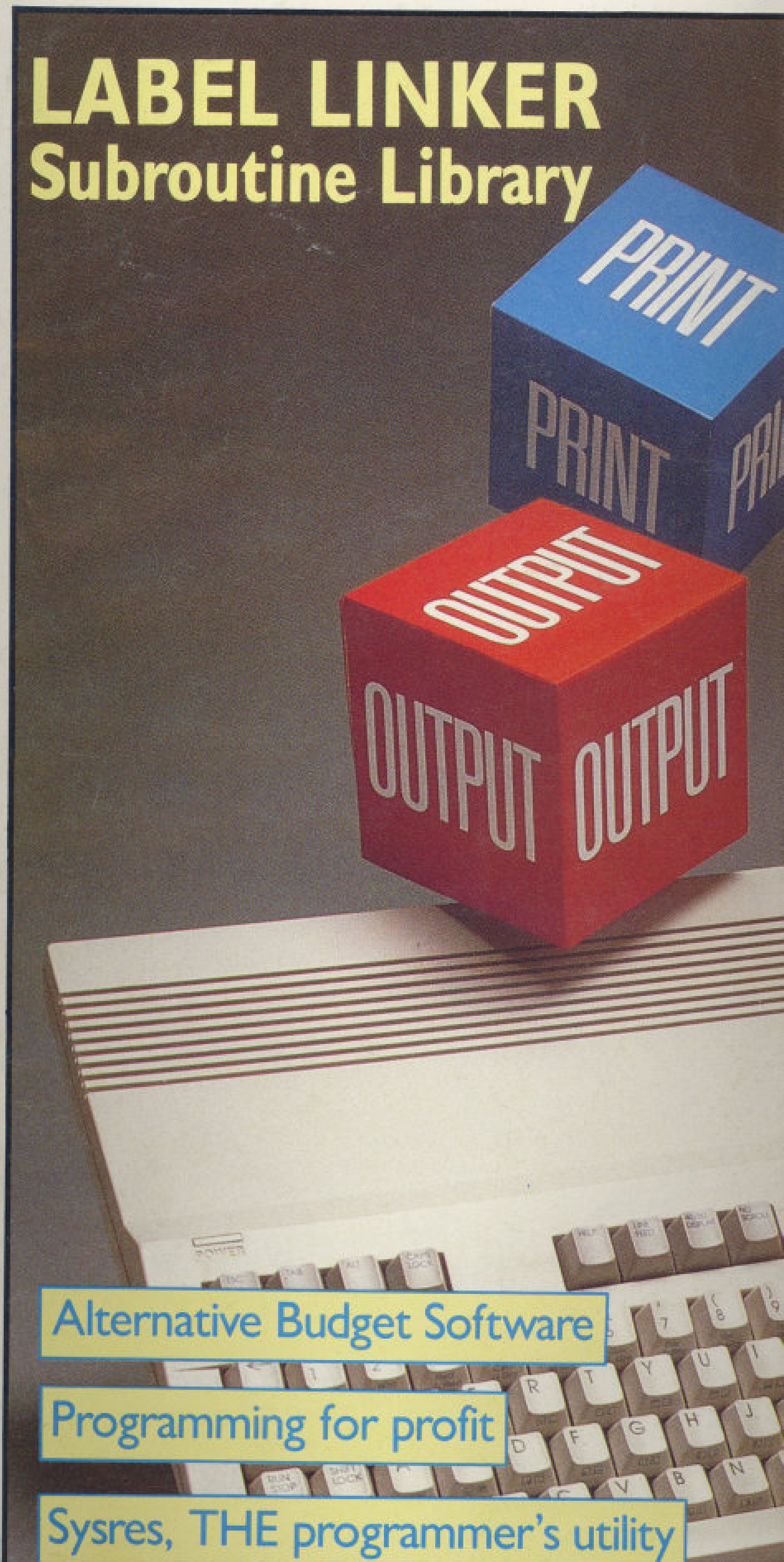




Your Commodore March 1938 Volume 4 Number 6

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